A quantitative examination of ostensibly extrasensory experiences occurring spontaneously and in laboratory conditions

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A Quantitative Examination of Ostensibly Extrasensory Experiences Occurring Spontaneously and in Laboratory Conditions

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Abstract

Parapsychological research, including the examination of the anomalous process termed 'psi', is highly controversial, with the existence of psi not accepted by mainstream science. The aim of this thesis was to study one aspect of psi, extrasensory perception (ESP), to examine whether evidence for ESP could be obtained or whether ostensibly extrasensory experiences can be attributed to purely psychological processes. Three studies are reported. The first obtained reports of spontaneous cases of ostensible ESP from 94 participants, using an online survey. Participants described their experience and responded to a series of questions regarding the aftermath of their experience and their reasoning for a paranormal interpretation. Results demonstrated several patterns that replicated earlier findings, including the predominance of female percipients, serious events, and close relationships between the percipient and target person. Negative emotions were common, including shock and confusion, particularly at the point of ostensible confirmation of the experience; the most common long-term response was an increase in paranormal belief, although some participants were relatively unaffected. Approximately two-thirds of participants had considered viable normal explanations for their experience, including coincidence and expectation of likely outcomes. Paranormal explanations were commonly attributed to the lack of a viable normal explanation, the striking coincidence between the experience and event, or the unusual nature of the experience. Many cases were weak evidentially; findings overall suggest that many ostensibly extrasensory experiences may have non-psi explanations. Two subsequent studies examined ESP in laboratory conditions, using the ganzfeld paradigm. Based on findings from spontaneous case research and previous laboratory

studies, it was examined whether success was related to the emotional bond between pairs of participants, or to their sexes. The first study employed 30 pairs of participants, each taking part once as sender and once as receiver. Picture postcards were used as targets, and an emotional connectedness scale was used to assess pairing closeness. Direct hits and binary hits were above mean chance expectation (MCE); both were non-significant, although binary hitting was only marginally so. Results were suggestive of improved performance for closer pairings and mixed-sex pairings, but were non-significant. The second study was a partial replication, with 40 pairs of participants and using video clips as targets. EEG recordings were taken from the frontal midline (Fz) site of both participants. Approximately half of senders experienced stroboscopic stimulation at 6Hz throughout the trial in an attempt to drive theta rhythms associated with a hypnagogic state, mirroring the state expected in receivers due to ganzfeld stimulation. Direct hits were at MCE, while binary hits were non-significantly above MCE; binary hitting across the two studies was significant. There was no effect of pairing closeness or sexes on success, and hitting was not associated with any EEG features or with strobe usage.

Overall, laboratory findings appeared promising in terms of significant binary hitting but continued a trend of inconsistency within and between ganzfeld ESP studies. This inconsistency, together with the many weakly evidential spontaneous cases collected, point more strongly to a psychological interpretation of ostensibly extrasensory experiences, rather than the elusive psi.

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Contents

Index of Tables

Index of Figures

Chapter 1

Introduction

1.1. Extrasensory Experiences, Extrasensory Perception, and Psi

An extrasensory experience is defined by Irwin and Watt (2007: 5) as one in which "the experient's mind appears to gain information directly, that is, seemingly without either the mediation of the recognized human senses or the processes of logical inference". The ostensible process by which this information is gained is referred to as *extrasensory perception*, or ESP, a term first developed by Joseph Banks Rhine (1934/1964: xxix), although a similar term, *supersensuous perception*, had been used in earlier literature (e.g. Barrett, Gurney & Myers 1882: 13). Four types of extrasensory experience have been identified: telepathy, involving mind-to-mind communication; clairvoyance, the gaining of information regarding objective events; precognition, the gaining of information regarding a future event; and retrocognition, the gaining of information regarding a past event (Irwin & Watt 2007: 5). However, in practice it is in many cases difficult to categorise experiences in this manner; for example, if an individual is able to correctly deduce the identity of an image that another individual is viewing, it is unclear whether this is due to telepathy from the latter individual's mind, clairvoyance of the image itself, or even precognition of being informed of the identity of the image at a later time. These terms may therefore be considered as more indicative of the general character of the experience, rather than delineating distinct types or processes.

The study of extrasensory experiences and ESP constitutes one of three domains of parapsychological research, along with psychokinesis (PK, literally 'movement with the mind') and survival of bodily death (Irwin & Watt 2007: 6-7). ESP and PK are often referred to by the more general term 'psi', created by Wiesner (Thouless 1942: 5), due to the rather presumptive nature of the original terms (Irwin & Watt 2007: 6), while several researchers (e.g. Thalbourne 2004) have argued that they share a common process. However, extrasensory experiences involve an individual appearing to gain information through non-sensory means, while psychokinetic experiences involve an individual appearing to cause a change in the physical environment solely through willing such a change to occur; these qualitative differences between the two types of experience mean that the terms ESP and PK are still regularly used by way of differentiation (Irwin & Watt 2007: 6-7). In this thesis, focussed as it is on ostensibly extrasensory experiences specifically, the use of the term 'psi' is intended to refer more closely to ESP than to PK aspects.

1.2. The Current Status of Psi Research

Parapsychology is a highly controversial topic area, and despite the existence of some apparently strong experimental evidence (e.g. Palmer 2003) the existence of psi is not accepted by mainstream science. The general view of critics towards the field is best illustrated by Hyman (2009: 17), who argues that "the evidence for psi is inconsistent, elusive, and fails to meet accepted scientific criteria". In response Roe (2009) provides a number of examples to counteract these claims, including evidence of replicable effects in laboratory research (e.g. Bem, Palmer & Broughton 2001) and substantially greater use of double-blind methods than in other scientific fields (e.g.

Watt & Nagtegaal 2004). Nevertheless, Roe (2009: 23) concedes that "much work remains to be done" in terms of gaining scientific respectability; however, he also comments on the limitations in funding and human resources that adversely affect this topic area (Roe 2009: 25), raising doubts as to whether this work can be achieved. Roe's (2009) argument regarding the admirable level of scientific rigour in contemporary parapsychological research is sound, yet despite this, Hyman (2009) is correct that the evidence for psi does not yet demonstrate a truly satisfactory level of consistency and replicability.

Despite what is implied from debates such as these, the examination of psi remains a worthwhile endeavour. If replicable evidence of psi can be obtained, this could potentially lead to a major challenge to established physical laws. Although conclusively demonstrating that psi does not exist in any particular study is difficult, since any lack of evidence can be potentially interpreted as a lack of psi-conducive characteristics in the study, a consistent failure to provide replicable evidence can justifiably lead to a conclusion of the non-existence of psi. However, if this conclusion must be reached, there remains a vast array of potential research avenues examining purely psychological aspects of ostensible psi experiences and other paranormal phenomena; indeed, this is part of the remit of the recently demarcated area of anomalistic psychology (Holt *et al*. 2012). For example, if ESP does not exist, it must be asked why a relatively large proportion of individuals (e.g. 33-50%; Targ, Schlitz & Irwin 2000: 222) report having had an ostensibly telepathic experience. In many ways, questions such as this are as fascinating as the possibility that psi may be a genuine phenomenon.

Despite agreeing with Hyman's (2009) criticisms regarding inconsistent evidence and weak methodology in parapsychological research, Wiseman (2009: 21) argued that "it is worth giving psi one last chance by staging one final attempt to create a database that provides the best-shot of deciding the existence of psi", and suggested that this could be achieved by conducting methodologically sound studies using procedures that have already been identified as yielding the most promising results. Although many parapsychologists may disagree with these sentiments, it is clear from the articles by Hyman (2009) and Wiseman (2009) that mainstream researchers are lacking patience with the field, and require stronger evidence to maintain their interest. If parapsychological research is to achieve and maintain scientific credibility, it must be capable of demonstrating psi to the satisfaction of researchers in other fields. A general aim of this thesis is to present the findings from research that satisfies Wiseman's (2009: 21) requirements, in addition to research that takes an approach more in-keeping with that of anomalistic psychology. In order to provide context it is necessary to briefly summarise relevant past research before stating the more specific aims of the thesis.

1.3. Spontaneous Extrasensory Experiences

The beginning of the systematic study of extrasensory experiences coincided with the inception of the Society for Psychical Research (SPR) in England in February 1882. Although some rudimentary experimental studies were conducted (e.g. Barrett, Gurney & Myers 1882), most research over the first fifty years of the Society's existence involved collecting authenticated case reports of ostensibly paranormal experiences, such as ostensibly telepathic visions of people at the moment of their

death (e.g. Gurney, Myers & Podmore 1886a, 1886b), or cases of apparent precognition (e.g. Saltmarsh 1934). Authentication of cases included obtaining accurate names and dates, meeting the reporter to hear their account in person (Barrett, Massey *et al.* 1882: 117), and acquiring any written evidence of the occurrence of the experience that had been produced before the content of the experience was ostensibly confirmed (Stewart 1882: 37); such authentication was considered key to obtaining reliable reports and reducing the possibility of hoaxes (Barrett, Massey *et al*. 1882: 117). Although researchers were aware of the limitations of many case reports (e.g. Gurney *et al.* 1886b: 271), well-authenticated cases were generally taken as evidential of an anomalous process (e.g. Barrett 1882: 60-61, Stewart 1882: 37).

Despite the rigour of the early case collection methods, it became clear that so-called 'spontaneous' extrasensory experiences could not provide satisfactory evidence for the occurrence of psi phenomena; from the mid-1920s, psi research therefore began to focus more on experimental work (Rhine 1949: 292). However, in the late 1940s Joseph Banks Rhine (1948b: 232) argued that spontaneous cases could still have value in terms of providing suggestions for experiments; subsequently his wife, Louisa Rhine, became the leading researcher in this area (Rao 1983: 3-4), identifying a number of consistent patterns in her collection of many thousands of cases of ostensible ESP. In the late 1970s and early 1980s, Schouten (1979, 1981, 1982, 1983) conducted extensive quantitative reanalyses of three case collections, including that of Rhine, identifying further consistent results and allowing subsequent theorisation on the possible ESP process.

Chapter 2 of this thesis provides an in-depth review of the work and theorisation of Rhine and Schouten, in addition to discussing the theories of other researchers who have attempted to suggest how the ESP process may function, or have proposed non-paranormal explanations for the experiences. Despite the efforts of these researchers, Irwin and Watt (2007: 39) describe phenomenological research on extrasensory experiences as "still in its formative stage". This chapter also identifies a need for a more in-depth and critical examination of spontaneous case reports, with the rationale that both Rhine and Schouten appeared to move away from their initially objective positions towards interpreting the cases as being indicative of genuine ESP. Chapter 3 therefore reports the findings of a study that obtained a collection of contemporary reports of ostensibly extrasensory experiences; this study employed similar analyses to those of Schouten (1979, 1981, 1982, 1983) but also questioned participants further about their thoughts, feelings and behaviour in the aftermath of their experience, including their rationalisation of their experience as being a paranormal occurrence. Important questions, such as which 'normal' explanations have been considered for the experience, and why these have been rejected in favour of a paranormal interpretation, have rarely been asked, meaning that parapsychologists still do not have a full understanding of the experiences that form the basis for their entire field. This study aims to address this issue.

1.4. Laboratory Studies of ESP

1.4.1. Forced-Choice Studies

Although experimental ESP research had been conducted from the inception of the SPR, the necessary statistical tests to satisfactorily analyse the data were not developed until the 1920s (Beloff 1993: 126). Following this period, the researcher whose name was to become synonymous with parapsychology research was the aforementioned J. B. Rhine. Together with Karl Zener, Rhine developed a set of cards that subsequently became known as 'Zener cards' or simply 'ESP cards'. A standard pack of cards contained five symbols (circle, square, cross, star and wavy lines) each repeated 5 times; attempting to guess the symbols of each card in a shuffled pack of 25 cards (referred to as a 'run' of 'trials') would therefore produce a mean score of 5 correct guesses ('hits'), or 20%, if chance alone were operating (Beloff 1993: 133), but significantly higher (or lower) scores may indicate the occurrence of ESP. These cards allowed tests of clairvoyance, where the cards were shuffled and the participant attempted to guess their order with no-one viewing them, or tests of what was termed 'General ESP', where one participant (termed the 'agent', or 'sender') viewed the cards and a second participant (termed the 'percipient', or 'receiver') attempted to guess them; the term GESP takes account of the possible occurrence of either telepathy or clairvoyance (Beloff 1993: 134-135).

Rhine published his early findings in his book *Extra-Sensory Perception* (1934/1964). Initial Zener card testing with classes of college students (N = 187), each making just 5 guesses, produced scoring that was non-significantly below chance; due to this apparent failure, attempts were then made to find "special" participants by testing

anyone who was available to be tested on an individual basis (Rhine 1934/1964: 67-68). Rhine (1934/1964: 69-77) reported the results from 36 named participants who undertook between 10 and 2,885 trials; these individual tests were much more successful than the classroom tests, with 30 (83.3%) of the 36 participants obtaining a score greater than chance, 3 (8.3%) obtaining a score below chance, and 3 (8.3%) obtaining a score of exactly chance. From these studies, eight particularly promising participants were identified, who were tested further and found to be able to score significantly above chance consistently across a large number of trials. These included Adam Linzmayer, who obtained a mean of 6.7 hits per run over 4,505 trials (including one experimental period of 600 trials that produced a mean of 9.9 hits per run; Rhine 1934/1964: 86), and Hubert Pearce, who obtained a mean of 7.9 hits per run over 16,975 trials (Rhine 1934/1964: 113).

Rhine's 'forced-choice' testing paradigm thus appeared to be highly successful; however, it was subjected to much criticism. Space limitations do not permit a full discussion of these criticisms, but Smith (2010: 250) claims that researchers discount the first decade of Rhine's work with Zener cards, due to inadequate precautions against 'sensory leakage' and cheating. In clairvoyance studies participants were often able to view the backs of the cards, allowing them to see slight indentations that may have identified the embossed symbols, while in GESP studies they were able to see and hear the experimenter and take note of subtle facial expressions (Smith 2010: 250). Despite these issues, Rhine is still regarded as "the father of modern experimental parapsychology" (Irwin & Watt 2007: 51) due to the influence his techniques had upon the development of the discipline.

1.4.2. Free-Response Studies and the Ganzfeld Paradigm

Following much experimentation with Zener cards and other forced-choice testing paradigms, researchers began to search for other ways of examining ESP; this was partly in response to a decrease in popularity of behaviourism and an increase in a more humanistic approach in the 1960s, but also due to the very dry nature of repeated card-guessing (Beloff 1993: 161). This quest led to the development and use of 'free-response' techniques, a term that appears to have been created by Stuart (1945: 93). In a free-response test the target, which may be an object, image or a geographical location, has no pre-determined range; the participant must attempt to describe their impressions of what the target is, and this description is subsequently compared against several potential targets either by the participant or an independent judge (Beloff 1993: 161). In this instance a 'hit' is designated when the correct target is judged to most closely match the description from the participant; therefore, despite the differences in procedure, statistical significance can be assessed in a similar way to forced-choice testing (Beloff 1993: 161).

As proposed by J. B. Rhine (1948b: 232), the findings of spontaneous cases were able to provide suggestions for free-response testing paradigms. For example, the high proportion of cases occurring in dreams (e.g. Rhine 1953a) led to the conducting of the highly successful dream ESP studies in the Maimonides medical centre in New York (Ullman, Krippner & Vaughan 1973), where participants' descriptions of their impressions of the target were obtained through their dream imagery. In these studies, success was measured through the number of 'binary hits', defined as the target image being ranked in the top half of the target set (Sherwood & Roe 2003: 87); a meta-

analysis of 450 trials demonstrated a highly significant overall binary hit-rate of 63% from independent judges' rankings, compared to the 50% expected by chance (Radin 1997: 71-72). However, arguably the most successful free-response testing paradigm has been that of the *ganzfeld*. This thesis reports two studies using this technique, therefore it is necessary to summarise the debate surrounding its overall success, making reference to Palmer's (2003) excellent review.

The German term ganzfeld translates as 'whole field', and appears to have been first used by Metzger (1930 cited in Hochberg, Triebel & Seaman 1951: 153) to refer to homogeneous visual stimulation, although the term is now used to refer to a more extensive paradigm. To create such stimulation in their participants, Bertini, Lewis and Witkin (1964) placed translucent hemispheres (halved ping-pong balls) over the eyes of their participants and shone a diffuse red light towards them. In addition, white noise was played into participants' ears to add a monotonous auditory stimulus to the homogenous visual field. These researchers described their technique as an "experimental-hypnagogic" procedure (Bertini *et al*. 1964: 496), referring to the state of hypnagogia that occurs between being awake and falling asleep (Alvarado 2000: 193). Bertini *et al*. (1964: 495) reported that their technique facilitated drowsiness while simultaneously encouraging the creation of spontaneous imagery.

Bertini *et al*.'s (1964) adaptation of the ganzfeld environment was subsequently introduced into parapsychological research in a study by Honorton and Harper (1974), due to the apparent psi-conduciveness of simple relaxation (Honorton 1974: 248) and altered states of consciousness (ASCs) such as hypnosis, dreaming and meditation (Honorton & Harper 1974: 156-157). Honorton (1974: 250) argued that psi reception

could be facilitated by reducing sensory input and processing, thereby reducing the number of irrelevant stimuli and allowing relatively weak psi impressions to be more easily detected. In this way, ganzfeld stimulation was argued to create an "internal attention state" (Terry & Honorton 1976: 216), and the imagery and ideation produced by the procedure were seen as capable of bringing the psi information into consciousness (Honorton & Harper 1974: 160).

Palmer (2003: 53-54) describes the typical parapsychological experimental ganzfeld procedure as follows. The participant designated as 'receiver' is seated in a comfortable reclining chair, following which the hemispheres are attached to their eyes, headphones are placed over their ears, and a red lamp is aimed towards them at a suitable distance to create a homogeneous pinkish-red field. Initially, progressive relaxation suggestions are played through the headphones, before pink noise (similar to white noise but with the harsher high frequencies removed) is played for the remainder of the trial, which may be around 30-45 minutes in length. During this time the participant reports out loud any images or impressions that they experience, and this report of their mentation is recorded by the experimenter. In most cases during the trial a 'sender' participant in a separate room views a randomly selected target, which may be 'static' (e.g. a photograph or painting) or 'dynamic' (e.g. a film clip). Following the reception period the receiver is reminded of their mentation, and is shown four possible targets, one of which is a duplicate of the actual target. The participant is then asked to rank these possible targets based on their impressions during the trial. Ranking the correct target first is referred to as a 'direct hit', while ranking the correct target first or second is referred to as a 'binary hit'. Mean chance expectation (MCE) is that participants will obtain 25% direct hits and 50% binary

hits; statistically significant deviations from these figures over multiple trials may be taken as evidence for ESP.

Honorton and Harper's (1974) seminal study obtained significant direct hitting, and was followed by numerous other studies using the ganzfeld procedure. In 1985, Hyman (1985) considered ganzfeld research as the most promising in parapsychology, and conducted a review and meta-analysis of 42 studies in 34 separate reports, published between 1974 and 1981. Hyman (1985: 27-28) identified a number of procedural flaws, including inadequate randomisation, the use of a single target image that may have displayed evidence of being handled by the sender, and the use of a single experimenter rather than having separate experimenters monitor the sender and receiver. He also identified statistical issues such as the use of multiple analyses and multiple indices of success (Hyman 1985: 20-23), and suggested that there had been a tendency to publish small, successful studies while unsuccessful studies remained unpublished (the 'file-drawer problem'; Hyman 1985: 11-16). While Honorton had claimed 55% of the studies were significant at the .05 level (Hyman 1985: 5), Hyman (1985: 15) considered that the success rate was in fact 31%, and that the corrected alpha level was closer to .25 (Hyman 1985: 25), rendering the success of the overall database far less impressive than claimed.

In response, Honorton (1985) conceded that multiple analyses were a problem, and conducted a meta-analysis on the 28 studies that reported direct hits; 12 of these were independently significant at the .05 level, and overall scoring was highly significant. Honorton (1985: 61-81) also disagreed with the extent to which Hyman claimed that results were due to flaws and the file-drawer problem. Subsequently, these two

researchers collaborated to produce a 'joint communiqué' (Hyman & Honorton 1986) detailing their areas of agreement and disagreement, in addition to making suggestions for improved methodology. Their views were summarised in the following quote: "Although we probably still differ on the magnitude of the biases contributed by multiple testing, retrospective experiments, and the file-drawer problem, we agree that the overall significance observed in these studies cannot reasonably be explained by these selective factors. Something beyond selective reporting or inflated significance levels seems to be producing the nonchance outcomes...Whereas we continue to differ over the degree to which the current database contributes evidence for psi, we agree that the final verdict awaits the outcome of future psi ganzfeld experiments – ones conducted by a broader range of investigators and according to more stringent standards" (Hyman & Honorton 1986: 352-353).

Prior to the publication of these articles, Honorton had already instigated a series of studies using an automated ganzfeld procedure ('autoganzfeld') at the Psychophysical Research Laboratories (PRL) that incorporated methodological improvements to the previously published studies. In addition to being published in a parapsychological journal (Honorton *et al*. 1990) the results of these studies were published in a mainstream psychology journal, *Psychology Bulletin* (Bem & Honorton 1994). Eleven studies were conducted, although one was removed from some analyses for methodological reasons; the ten remaining studies produced 106 hits from 329 sessions, giving a significant hit rate of 32%, very similar to the overall hit-rate of 33% from the pre-PRL studies (Bem 1994: 25). Bem and Honorton (1994: 13)

considered the requirement for more stringent standards to have been met, although they conceded that replications were still required from additional researchers.

Hyman (1994) praised the improved quality of the PRL studies, but still raised several issues. For example, he suggested that randomisation was not sufficient to account for response biases of participants (Hyman 1994: 21). He also noted issues with replicability; for example, the PRL studies found that sessions with dynamic targets gave significantly higher scores than those with static targets, and scoring for the latter was non-significantly above MCE (Bem & Honorton 1994: 12). However, Hyman (1994: 20) observed that the significant scoring of the pre-PRL ganzfeld studies was achieved with a majority of studies using static targets. In response, Bem (1994: 26-27) argued that randomisation issues, although present, showed no evidence of having produced the above-chance scoring; he also identified a result in the pre-PRL studies demonstrating that trials using multi-image View Master slide reels as targets obtained significantly higher hit-rates than studies using single-image photographs (Bem 1994: 25), analogous to the findings relating to dynamic and static targets in the PRL studies.

Following the report of the PRL research, a number of other ganzfeld studies were performed. Milton and Wiseman (1999) subsequently published a meta-analysis of 30 studies from 7 independent laboratories that had been performed since the publication of Hyman and Honorton's (1986) guidelines, finding a non-significant effect overall. In response, Storm and Ertel (2001: 426) argued that an analysis "based on a unified domain of ganzfeld data" (combining pre-PRL, PRL and post-PRL studies) would better allow a general conclusion to be drawn. These authors conducted a meta-

analysis including 79 studies, consisting of the 28 pre-PRL studies, the 10 PRL studies, Milton and Wiseman's 30 post-PRL studies, and an additional set of 11 studies from between 1982 and 1986 that Storm and Ertel had located (Storm & Ertel 2001: 426-427). A highly significant overall effect was found: Stouffer $Z = 5.66$, $p = 7.58 \times 10^{-9}$, $r = .138$ (Storm & Ertel 2001: 431). However, Milton and Wiseman (2001: 435-436) criticised these researchers for including methodologically weak pre-PRL studies; given the numerous flaws in these studies identified by Hyman (1985), their inclusion is indeed questionable. Milton and Wiseman (2001: 436) further criticised Storm and Ertel (2001) for applying inconsistent inclusion criteria, in that they excluded some studies that did not report direct hits whilst retaining others, and for using an inconsistent method for calculating study outcomes, in that they used the exact binomial method in some instances and the normal approximation to the binomial distribution in others; these criticisms also appear valid and render Storm and Ertel's (2001) findings problematic.

Milton (1999) published a new meta-analysis including nine additional studies to the analysis of Milton and Wiseman (1999). The new database of 39 studies provided a significant overall result, but the significance appeared entirely due to a very successful study by Dalton (1997); removing this study rendered the analysis non-significant. Even with this study included, Milton (1999: 311) argued that the effect size of the pre-PRL and PRL databases had not been replicated. Bem *et al*. (2001) subsequently published a further meta-analysis, adding a study by Alexander and Broughton (1999), and reported a significant overall effect. Bem *et al*. (2001) examined the degree to which each study had adhered to the standard ganzfeld protocol, and found a significant positive correlation between adherence and effect

size, suggesting that the analyses of Milton and Wiseman (1999) and Milton (1999) had been adversely affected by the inclusion of non-standard studies.

Although the debate surrounding the results of ganzfeld research has not fully ended, this brief summary has covered the key articles. The contributors to the debate have all relied on meta-analysis to argue their case, and the value of this technique has thus also become a point of contention. In principle, meta-analysis has the advantage of permitting an overview of the 'landscape' of a research area, avoiding reliance on the results of a single study, and allowing repeated results in the same direction across multiple studies to provide evidence in support of a hypothesis, even though they may be non-significant when examined individually (Rosenthal & DiMatteo 2001: 63). However, meta-analysis also has several disadvantages; for example, there is likely to be some inherent bias due to the chosen inclusion and exclusion criteria, and included studies may vary considerably in methodology and quality (Rosenthal & DiMatteo 2001: 66-68). The differences in findings of each analysis thus largely appear to be due to these issues with meta-analysis itself, rather than any specific errors committed by the researchers performing the analysis; other than Storm and Ertel's (2001) inclusion of studies known to be flawed in methodology, the discussed analyses are therefore difficult to distinguish in terms of their validity.

It is clear, then, that the use of meta-analysis, while intended to identify a clear overall pattern in the findings, has led to additional disagreements, with various disputes over key elements of the analytic procedure such as inclusion criteria. Hyman (2009: 18-19) also argues that meta-analysis can conceal inconsistency and provide a false impression of the replicability of an effect; nevertheless, it is still being used to argue

for the overall success of the ganzfeld technique (e.g. Storm, Tressoldi & Di Risio 2010). Overall, though, it is clear that ganzfeld research has produced numerous positive results, and so this paradigm satisfies Wiseman's (2009) suggestion of a procedure that has yielded the most promising findings.

1.4.3. Process-Oriented Research

Much of the discussion so far has concentrated on what may be termed 'proof-oriented' research, that is, research with the key aim of examining whether psi exists or does not exist. However, much research has also taken a 'process-oriented' approach, aiming to identify correlates of performance in order to understand how psi may function and therefore how to enhance performance in psi tasks. The aforementioned differences in success with static and dynamic targets identified in the PRL studies (Bem & Honorton 1994: 12) are an example of this; a basic interpretation of this result may be that psi is more effective with more 'life-like' stimuli. A further process-oriented consideration, particularly with respect to telepathic or GESP experiences, is the effect of the relationship between two people. Spontaneous experiences of this kind are mostly reported between people who share a close emotional or biological bond, such as identical twins (e.g. Brusewitz & Parker 2013), so it would seem that using closely bonded participants in experimental research may be a relatively simple way to increase task success.

Chapter 4 of this thesis reviews the relevant literature on this topic of the sender-receiver relationship and its effect on ESP task success. Similarly to the research using the ganzfeld environment, some findings appear potentially promising, yet there

is an overall pattern of inconsistency. It is also apparent that a finding from spontaneous case research has been neglected; this is the tendency for the person, who is more emotionally dependent on the other, to become the percipient in a spontaneous experience of ostensible telepathy between two individuals (Schouten 1983: 332). A large proportion of the reviewed studies did not assess actual closeness between the participants, or did not consider how the sender and receiver allocations may have affected their findings, which may explain some of the inconsistencies in the results. Chapter 5 therefore reports a ganzfeld study that more carefully examines the effect of the relationship between participants on success in a GESP task, using a quantitative measure of connectedness. The study also enables examination of whether recent findings of an apparent advantage for mixed-sex pairings (Dalton 1994, Hume 2003) are due to the participants' sexes per se or are an artefact of greater success for romantically attached pairings.

1.4.4. Electroencephalogram (EEG) and Unconscious Psi

As discussed previously, the ganzfeld environment was introduced into parapsychological research due to its potential as a psi-conducive hypnagogia-like state (Bertini *et al*. 1964). However, it is possible that participants may respond to ganzfeld stimulation in different ways, and so some individuals may enter more deeply into this state than others; this may in turn affect how successful the technique is at eliciting psi for any particular individual. One method of broadly assessing mental activity is through the electroencephalogram (EEG), involving the measurement of electrical activity in the brain through electrodes attached to the skin (Charman 2006: 2). It has therefore been possible to examine whether success in ESP

tasks is associated with a particular band of EEG activity; Chapter 6 presents a review of this research, and observes some inconsistency, both in the EEG frequencies focussed upon by researchers and in the findings obtained.

The ESP research discussed so far has all required the participant to make a conscious response that is subsequently matched against the target for the trial. However, early theorisation (e.g. Tyrrell 1946) proposed that psi information may become accessible to an individual unconsciously, via a parapsychological process, before being transferred into consciousness; indeed, some contemporary researchers (e.g. Stanford 2006) argue that psi operates in a largely unconscious manner. A number of studies have therefore been performed to examine whether individuals demonstrate unconscious responses to remote stimuli. EEG has also been used in studies of this kind, for example in examining whether the brain response of an individual to a stimulus, such as a flash of light, can be detected in another individual who does not experience the stimulus (Charman 2006). Chapter 6 continues by reviewing this research, and observes some seemingly promising findings in addition to further apparent inconsistencies. This chapter also covers recent research using the more advanced technique of functional magnetic resonance imaging (fMRI), before discussing additional theorisation on how the psi process may function. Following this, Chapter 7 reports a study that combines the ganzfeld environment, brain activity measurement of both participants and the attempted induction of specific brain responses in the sender; this study allows assessment of conscious and unconscious aspects of psi, in addition to examination of whether specific brain states of the sender or receiver are more conducive to task success. This study also attempts to replicate

the work of the study in Chapter 5, further examining the effect of the connectedness between participants on success in the task.

1.5. Summary

Extrasensory perception (ESP) is the ostensible process by which information appears to be obtained without the use of the recognised human senses or processes of logical inference (Irwin & Watt 2007: 5). The systematic study of ESP began with the inception of the Society for Psychical Research (SPR) in 1882, and for the first fifty years largely consisted of the collection of case reports; although many apparently impressive and well-authenticated cases were obtained, these could not provide satisfactory evidence for the existence of ESP. However, it began to be appreciated that such cases could provide suggestions for experimental work (e.g. Rhine 1948b: 232) and allow theorisation on the possible ESP process (e.g. Schouten 1979, 1981, 1982, 1983). Research thus continued using the case-collection approach, led predominantly by Louisa Rhine (Rao 1983: 3-4); however, in spite of her identification of a number of consistent patterns in these cases, there is still scope for additional phenomenological research on ostensibly extrasensory experiences (Irwin and Watt 2007: 39).

Although some experimental ESP research was conducted during the first fifty years of the SPR's existence, the development of appropriate statistical tests in the 1920s, and the creation of standard ESP cards by J. B. Rhine and Karl Zener (Beloff 1993: 133) led to Rhine becoming "the father of modern experimental parapsychology" (Irwin & Watt 2007: 51). Rhine (1934/1964) reported the results of a number of high-

scoring participants using the 'forced-choice' testing paradigm, but critics (e.g. Smith 2010: 250) have identified numerous methodological issues with Rhine's studies. Subsequent development of 'free-response' techniques allowed for more realistic testing scenarios, such as the successful dream ESP studies conducted at the Maimonides medical centre (Ullman *et al*. 1973); however, arguably the most successful testing paradigm has been that using an "experimental-hypnagogic" procedure (Bertini *et al*. 1964: 496) known as the ganzfeld. Despite numerous positive results, an extensive debate, relying heavily on meta-analyses, has proven inconclusive; proponents (e.g. Bem *et al*. 2001) argue that the overall ganzfeld research database provides support for the existence of ESP, while critics (e.g. Milton & Wiseman 2001) argue that it does not.

In addition to 'proof-oriented' research, examining whether or not ESP exists, research has also been conducted with a 'process-oriented' approach, aiming to identify correlates of performance in ESP tasks. For example, the prevalence of spontaneous ESP experiences involving closely bonded individuals such as twins (e.g. Brusewitz & Parker 2013) has led to examination of the effect of the relationship between two participants on ESP task success. In addition, process-oriented research has employed brain imaging techniques such as EEG recordings to examine whether task success is associated with particular patterns of brain activity; EEG and the more advanced technique of fMRI have also been used in more recent proof-oriented research to examine whether brain responses of an individual to a stimulus can be detected in another individual who does not experience the stimulus. Similarly to research using the ganzfeld procedure, all of these various research programmes have

produced some support for the existence of ESP, whilst also showing some inconsistencies in their findings.

Overall, despite much apparent empirical evidence for the existence of ESP, critics remain unconvinced, arguing that the evidence is inconsistent and does not meet accepted scientific criteria (e.g. Hyman 2009: 17). Nevertheless, other sceptical commentators remain open to the possibility that the existence of ESP may yet be demonstrated; Wiseman (2009: 21) in particular has argued for the creation of a new database of methodologically sound studies that may finally settle the debate. If replicable evidence of ESP is obtained, this may lead to a serious reconsideration of established physical laws; however, if such evidence is not forthcoming, there remains much potential for research examining why individuals report ESP experiences despite this lack of evidence.

1.6. Aims and Overview of the Thesis

This thesis reviews three sets of literature and reports three studies with different, but related, foci. These reviews and studies aim to examine the three main spheres of research on ESP, namely spontaneous experiences, laboratory studies involving conscious responses, and laboratory studies involving unconscious responses. Only by examining relevant literature and conducting this range of research can one attain a full appreciation of the factors involved in ostensibly extrasensory experiences.

Chapter 2 provides an in-depth review of research covering spontaneous ESP experiences, and discusses theories of how the ESP process may function, in addition

to non-paranormal explanations for the experiences. In response to an identified need for a more in-depth and critical examination of spontaneous case reports, Chapter 3 presents a study that obtained a collection of contemporary reports of ostensibly extrasensory experiences; this study questioned participants in-depth as to their thoughts, feelings and behaviour in the aftermath of their experience, including questions relating to why the participant rejected normal explanations in favour of a paranormal interpretation. Examining spontaneous experiences in this manner allows an initial basic assessment of whether there is a strong likelihood of ordinary psychological processes being involved in all cases, or whether there are any particularly striking cases that are at least suggestive of the operation of an anomalous process that requires further assessment in the laboratory.

On the basis that further assessment in the laboratory is indeed warranted, Chapter 4 reviews the experimental literature on the topic of the sender-receiver relationship and sex pairing, which are variables that spontaneous case research suggests may be important in determining the occurrence of an ostensible ESP experience. This chapter identifies the need for a more thorough examination of these variables; Chapter 5 subsequently reports a study, using the ganzfeld paradigm, that more carefully considered the allocations of sender and receiver, and that used a measure of connectedness to better quantify relationship strength. Chapter 6 then reviews experimental research that has used brain imaging techniques, either EEG or fMRI, in studies of ESP. This chapter identifies potential for a study to examine both the conscious and unconscious responses of a participant during an ESP task, whilst also examining whether specific brain states of the sender or receiver are conducive to task success. Chapter 7 presents such a study, using the ganzfeld paradigm in conjunction

with EEG recording; this study also attempted to replicate the work of the study in Chapter 5, further examining the effect of the sender-receiver relationship and sex pairing on task success. As stipulated by Wiseman (2009: 21), the laboratory studies are methodologically sound, and use procedures, such as the ganzfeld paradigm, that have been identified as yielding the most promising results. They also assess factors, such as the connectedness between the sender and receiver, that spontaneous cases have suggested may be of relevance and that may assist in the conducting of future successful studies by identifying variables that are conducive to success. Chapter 8 discusses what can be concluded from the literature reviews and studies presented in this thesis, and provides suggestions for how research on ESP may progress in light of its findings.

It is clear that, despite over 130 years of study, parapsychologists have failed to convince mainstream science of the reality of paranormal phenomena such as ESP, and studies are needed that can attempt to settle the debate for one side or the other. The overall aim of this thesis is therefore to combine spontaneous case research with laboratory research in an attempt to examine whether, together, they point to the operation of parapsychological or purely psychological processes in the occurrence of ostensibly extrasensory experiences.

Chapter 2

Spontaneous Cases of Extrasensory Perception

2.1. The SPR and Early Studies of Spontaneous Cases

Upon the inception of the Society for Psychical Research (SPR) in 1882, six Committees were set up to focus on specific areas of study; four of these contained aspects that would now fall under the definition of ESP. The first examined "any influence which may be exerted by one mind upon another, apart from any generally recognised mode of perception" (Anon. 1882: 3); this committee was originally referred to as the committee on 'thought-reading', although this was subsequently altered to 'thought-transference' (Gurney, Myers & Barrett 1882: 70) to avoid the suggestion that people were able to read everything that occurred in the mind of another person (Gurney *et al*. 1886a: 10). The committee on Mesmerism studied anomalous phenomena, such as clairvoyance, occurring during Mesmeric trance and hypnosis, whilst part of the remit of the committee on apparitions and haunted houses was to investigate "apparitions at the moment of death, or otherwise" (Anon. 1882: 3-4). Finally, the literary committee was charged with the "collection and collation of existing materials bearing on the history of [the subjects considered within the scope of the Society]" (Anon. 1882: 4); this included the collection of spontaneous case reports of all relevant phenomena and thus somewhat overlapped with the activities of the other committees.

Even at this nascent stage in the Society, there was some uncertainty over the evidential value that could be placed on case reports. In the first report of the

committee on thought-reading, Barrett, Gurney and Myers (1882: 30) suggested that the evidence for an anomalous process had "necessarily a lower rank" for spontaneous cases than for the rudimentary experimental work that the authors had conducted. However, in response, Stewart (1882: 37) argued that there was already a strong body of evidence for some kind of anomalous process, particularly for the appearance of one individual to another at the time of the former's death; Stewart (1882: 37) suggested that the combined probability of such an appearance and the actual death happening within ten minutes of each other was so small as to rule out coincidence. Barrett (1882: 60-61) disagreed to some extent, suggesting that the operation of coincidence would be a justifiable argument if cases were very rare, but also argued that enough well-authenticated cases existed to render the coincidence hypothesis difficult to accept. However, in practice, it is extremely difficult to calculate the exact likelihood of such a coincidence occurring, or the number of such coincidences that an individual should expect to experience in their lifetime. Holt (2004) provides an approximate calculation to this effect, stating that, if each individual knows ten people who die each year, and thinks of each of them once annually, this leads to a 10 in 105,120 chance that the individual will have a thought about one of those people in the five minutes before hearing of their death; in the UK alone, this would equate to approximately 6,000 individuals per year, or 16 per day, having an experience of this type, rendering such experiences far less rare than may be supposed. The issue is further complicated by the fact that, for example, an individual may have more regular thoughts about a person who they know to be unwell, or may even have an apparently anomalous experience in response to unconsciously noticing signs of the person's ill-health (West 1948b: 272); explanations of this kind will be discussed in more detail later in the chapter. Such considerations as these render it extremely difficult to rule

out the possibility of coincidence in the manner of Stewart (1882: 37) and Barrett (1882: 60-61), and would suggest the evidential value of spontaneous cases is poor.

In light of their questionable evidential value, the issue of authentication was considered key to early investigations of spontaneous cases. In its first report, the literary committee expressed concern at the possibility of hoaxes, particularly in response to public appeals for information. To combat this problem, the committee would only consider a case if authenticated by names and dates, and would in most cases attempt to "make the personal acquaintance of the narrator, and hear his story told in a manner which pledges his honour to its truth" (Barrett, Massey *et al*. 1882: 117). In the case of the appearance of an individual at the time of their death in a distant location, Stewart (1882: 37) proposed that written communication of the appearance of the individual, made before the knowledge of the death was obtained, would be highly desirable as evidence that something unusual had taken place; such a written record would of course also be advantageous when relating to non-fatal events.

A number of publications were subsequently produced that reported collections of such authenticated cases. The first was a two-volume collection entitled *Phantasms of the Living* (Gurney *et al*. 1886a, 1886b); the key aim of this was to demonstrate that apparitions of people undergoing some form of crisis, such as dying, did not necessarily require any influence from deceased entities, but could be explained through telepathy from the person undergoing the crisis (Gurney *et al*. 1886a: lxv-lxvi). This was followed by Eleanor Sidgwick's collections of premonitions (Sidgwick 1888-9) and clairvoyant experiences (Sidgwick 1891), and Henry Sidgwick

and colleagues' 'census of hallucinations' (Sidgwick *et al*. 1894). This authenticated case collection approach continued into the 20th century, with collections of cases of telepathy (Sidgwick 1922) and precognition (Saltmarsh 1934). Two works by Prince (1928, 1931 both cited in Rhine 1949: 293) used only testimony from prominent and purportedly trustworthy individuals, such as scientists, businessmen and magicians, in an apparent attempt to validate the cases by authority.

2.2. The Research of Louisa Rhine

2.2.1. Rhine's Approach to Case Collection

From the mid-1920s, psi research began to focus more on experimental work (Rhine 1949: 292). Although case collections such as those by Prince (1928, 1931 both cited in Rhine 1949: 293) and Saltmarsh (1934) were published, spontaneous experiences began to be largely disregarded due to their inability to provide evidence of the occurrence of psi phenomena, in spite of the best efforts of the early members of the SPR in carefully screening and verifying the cases (Rhine 1949: 292). Despite being now best known as "the father of modern experimental parapsychology" (Irwin & Watt 2007: 51), it was actually J. B. Rhine (1948b: 232) who argued for the continued value of spontaneous cases, due to their ability to provide suggestions for experiments, in terms of the specific phenomena that appeared to occur spontaneously (e.g. telepathy) and the conditions (e.g. hypnosis) under which those phenomena appeared to occur. Rhine (1948b: 232-233) suggested that, once the requirement is removed for spontaneous cases to act as evidence of psi, the lengthy and troublesome authentication process is no longer required, allowing the consideration of a large

amount of data that would otherwise be ignored; the worst outcome of considering an unsound case would be an experiment that provides null results, but this is unlikely to happen since researchers are much more likely to base experiments on recurring characteristics found in multiple cases rather than on any single case. Therefore, although spontaneous cases cannot provide evidence of psi, they can at least give clues as to its nature.

Following Rhine's (1948b) call for more studies of spontaneous cases, it was his wife, Louisa, who was to become recognised as the leading researcher in this area, collecting many thousands of cases until her death in 1983 (Rao 1983: 3-4). Mrs. Rhine accepted cases "with or without supplementary validation if they seemed to be contributed in good faith and by apparently sane individuals" (Rhine 1951: 165-166); the only other key criterion was that the experience needed to have some apparent psi aspect (Rhine 1951: 166). Her rationale for this method of collection was that a large number of similar cases would more likely represent a valid process, with individual errors of testimony able to be cancelled out (Rhine 1970: 154). Mrs. Rhine's more liberal and more phenomenological approach allowed identification of a number of aspects of ostensibly extrasensory experiences; in one of her earliest articles, examining 1,073 cases, Rhine (1953a) identified four different subjective forms of the experience, which she referred to as i) intuitive, ii) hallucinatory, iii) unrealistic dreaming and iv) realistic dreaming. Rhine (1953a: 81) considered that these forms were different enough to warrant these separate classifications, but conceded that none of the terms were perfectly adequate in defining the groups. Indeed, the 'intuitive' form contains several relatively distinct subtypes, and there is often some difficulty in classifying a dream as entirely realistic or unrealistic, but Rhine's

classifications are largely satisfactory in terms of delineating four broad forms of experience. Although published some 60 years ago, Rhine's categorisation of the forms has remained intact, having been applied to case collections of other researchers (e.g. Green 1960, Hagio 1994). In addition, when later reviewing her collection, Rhine (1969: 230) argued that even this initial subset of cases was sufficient to identify the various types and forms of experiences, and that all subsequent cases had added to the numbers in these established categories rather than indicating that any others needed to be included. As such, Rhine's (1953a) original article is worth considering in some detail.

2.2.2. Rhine's Forms of ESP Experience

2.2.2.1. Intuitions

Rhine (1953a: 82) defined intuitive cases as instances involving a hunch, guess or idea; the participant reported they suddenly "just knew" something, which was later judged as corresponding with an event or situation, despite the knowledge apparently not coming through any normal sensory channels or being derived from rational thought. The impressions in these cases were limited in content, at most containing the essential meaning of the event with no other details included (Rhine 1953a: 82-83). An example is as follows:

> "I pulled up in front of my niece's house. She had her radio on loud, no other sound. As I sat there a moment looking at her house, I said to myself, 'She has a bird'. I went in and there in her front room she had two love

> birds in a cage. Her husband had brought them to her the night before. I didn't see how I could have known this" (Rhine 1953a: 84).

In this case, details such as the type of birds, the number, and where they had come from, were not included in the impression, but the essential meaning ('she has a bird') was present. Rhine (1953a: 85) also identified intuitive cases where the essential meaning was less clear, either in terms of the event or the person to which it had happened; these were often accompanied by a strong emotion. For example:

> "One day when I was working, I suddenly stopped and said to the girl next to me, 'Oh, my mother! Something has happened'. The girl said, 'Don't be silly. They would have let you know'. But I got no work done. On returning home for dinner I found mother's head all bandaged. She had been knocked down on the main road at the time I started to worry" (Rhine 1953a: 85).

In this case there was a clear impression that some misfortune had befallen the participant's mother, accompanied by sadness and worry, but the essential meaning (considered by Rhine as 'mother was knocked down') was not fully apparent. Another form of intuitive case was also identified that Rhine (1951: 181) in an earlier article had referred to as 'blocked' due to the lack of conscious knowledge obtained by the experient. Rhine (1953a) further separated such cases into two types, 'emotional' and 'compulsive'. Emotional cases were those where the participant experienced a sudden emotion, for example:

> "One morning when [my grandmother] came downstairs, instead of buzzing around doing household tasks and seeing that everyone else did too, she told us that something terrible was going to happen. She had no explanation or details, just this dreadful premonition. All day she sat around rocking in a chair on the porch, moaning or sobbing quietly. At bedtime we laughed it off and the next day she was her usual down-to-earth self, but during that day a cablegram was delivered telling of the death the day previously of my grandmother's sister in Scotland" (Rhine 1953a: 88).

Compulsive cases were those in which the experient felt suddenly compelled toward action, for example:

> "I was attending church service on Sunday morning when I felt that I must go home. It was before the sermon and it was unthinkable that I should leave, but I did and when I turned into our street, our small son ran to meet me saying, 'Eleanor fell off the horse and was very badly hurt.' I ran the rest of the way. My husband had put the little girl on the horse and a neighbour's child had whipped it, which made it jump. Fortunately no bones were broken but she was badly bruised" (Rhine 1953a: 88).

Rhine (1953a: 87) observed that emotional and compulsive aspects may often be present in the same experience; for example, a strong emotional aspect may lead to the compulsion to act. However, the dominance of one aspect may depend on the nature of the case; for example, if for any reason taking action was impossible, the emotional aspect would be more prominent. Rhine (1953a: 86) was concerned that

these ‘blocked’ cases did not contain any specific facts that would allow a relationship between the experience and event to be definitely determined, but included them as possible instances of psi due to their frequency as well as “their vividness, a certain similarity in the emotional quality described, and the strong tension that marks them”. Furthermore, having defined ‘intuitive’ cases as involving the experient ‘just knowing’ something, Rhine (1953a: 86) was aware that the emotional and compulsive cases did not fit especially well with this definition, due to the lack of any knowledge of the essential meaning of the event. However, she argued that it was the manner in which the experience entered into consciousness that could be considered intuitive, since there was no precursor of a rational or sensory nature, and that the ‘blocked’ cases could simply be considered as being at the lower end of a continuum of the amount of information contained in the experience (Rhine 1953a: 86-87). As discussed later in the chapter, the other three forms of experience all contain some sensory element by which the ostensible psi information comes into consciousness, so there is certainly face validity in grouping these different types of ‘intuitive’ experience together, irrespective of the accuracy of this term.

2.2.2.2. Hallucinations

Hallucinatory cases were those involving the sudden occurrence of a conscious impression in the form of a sensory experience, despite the apparent absence of any physical stimulus for such an experience (Rhine 1953a: 92). These included experiences relating to the main five senses such as vision, audition and olfaction, for example:

> "My mother-in-law told me that her son was in the habit of going into town each Saturday to get groceries. One Saturday, he was so late returning that they were worried, and she said that she and her brother and another person were watching the road for him when one of them said, 'There he comes now.' All three of them ran to the door, and he was running very fast with his market basket over his arm, but instead of stopping at the house, he ran on and jumped over the fence into swampy ground and disappeared. A few minutes later someone called and said that he had been killed in an automobile accident" (Rhine 1953a: 92-93).

Experiences also occurred that involved more general feelings such as pain and illness, for example:

> "Last year I had an impacted wisdom tooth. Infection developed and an operation had to be performed. At the exact time I was going through it, my son in Niagara Falls had a terrific pain in his face and without any warning. It continued for the three days I haemorrhaged" (Rhine 1953a: 94).

Rhine (1953a: 96) observed that, similarly to the 'blocked' intuitive experiences, none of the hallucinatory experiences contained apparent "factual knowledge" of the event; experients only recognised the ostensible meaning of the experience by inference or upon obtaining information at a later time point.

2.2.2.3. Unrealistic Dreams

Unrealistic dreams were cases where the experience included imagery and detail with an unreal or fantasy content; these cases ranged across a wide continuum, from those in which the departure from reality was minimal, to those that were heavily symbolic (Rhine 1953a: 96). An example of the former type is as follows:

> "My married daughter visited me. She said nothing about her condition. I have a bad heart and they never tell me anything. I dreamed she was pregnant and I teased her in my dream about it and she didn't deny it. I told my single daughter something of my dream. She laughed at me. About two weeks later, the married one wrote that she was in a hospital being given penicillin and glucose and that her little five-year-old girl wouldn't have a little sister. She had miscarried" (Rhine 1953a: 97).

An example of a more symbolic dream is as follows:

> "I was working away at the dishes one morning as usual, and my thoughts were a thousand miles away. The day was bright and sunny and I suppose my eyes were looking at the field across from the back yard. For no apparent reason I found that I was hurrying along the main walk in a cemetery where we had a family lot. However, I did not turn down the path leading to our lot. I kept right on the main road and I was in quite a hurry. There was no sorrow attached to the scene and not the least surprise or curiosity. I was simply there, hurrying along in a casual sort of way, when I got to a certain lot which I had

> seen only once before, over 20 years ago. The lot belongs to an old neighbour friend and when his son had been buried I stood there in reverence some 20 years before. In the more recent years I had scarcely thought of the M's burial lot.
>
> "Work chased the incident away. I had the whole day before me and forgot the entire scene. That night when I picked up the evening paper I did an unaccountable thing, which was to turn directly to the death column. Almost at once I looked directly at the name M-----. The neighbour known to my childhood had passed away in New York. She was 90. I had not heard from her for many years. I had once written to her at the time of my mother's death concerning immortality. She had replied that her faith in immortality was deep and that she would like to have some reassurance of it. I did not hear from her again" (Rhine 1953a: 98-99).

This example is also important because it illustrates a key aspect, namely that not all of the 'dream' cases were during sleep, but could also occur during daydreams. By way of distinction between hallucinations and waking dreams, Rhine (1953a: 101) considered that an instance in which an experient confused their experience with actual vision would be classified as a hallucination, whereas an instance where the experient knew their experience was confined to their 'mind's eye' would be classified as a dream. However, waking cases were rather rare; only 4 of 184 unrealistic dream cases occurred whilst awake (Rhine 1953a: 82), but they had the same general characteristics as those that occurred whilst asleep (Rhine 1953a: 96).

2.2.2.4. Realistic Dreams

Realistic dreams were those in which the experience was a clear and realistic mental image, reproducing some or all of the event to which it seemed to be related; these experiences were predominantly visual, and some included all of the details of the event, unlike any of the other three forms (Rhine 1953a: 101). An example of a detailed realistic dream is as follows:

> "My sister-in-law lives in Baltimore and teaches a Sunday School class in one of the Episcopal churches there. One Saturday night she dreamed that she was at Sunday School and that as she went out of the church, two men came from the basement of the church carrying a man on a stretcher with his hands folded across his breast, and upon looking closer she saw that it was the church janitor. The next morning when she was leaving Sunday School, she was quite shocked to see two men carrying a stretcher with the janitor on it, his hands folded on his breast just as she had seen them in her dream. The janitor was dead. A heart attack in the basement during Sunday School" (Rhine 1953a: 103).

The experience did not need to be an exact replica of the event for Rhine to categorise it as 'realistic'. The impression may not have been a full image of the event, or may have been a representation of a scene that was related to or suggested by the event scene (Rhine 1953a: 106). For example, the following case contains an incorrect detail:

> "During the second year that my husband was in the service, our little boy broke his wrist. The night before it happened I dreamed that he was tossing in his bed, hot and feverish with his arm in a cast, and I felt faint from the smell of ether. The only thing that was different the next night was the ether smell, for they had given him gas when they set it" (Rhine 1953a: 103).

The following example contains a realistic scene but one that was tangential to the apparent meaning:

> "The first night we lived in the new house, my mother had a dream. She said she saw a funeral down the street a way. The house where she saw it was quite small and occupied by Italians. The hall in it was so narrow that it was necessary to bring the casket out through the windows. But there was not much sense to that dream and what could it mean, if anything? But early in March, sure enough, a funeral procession came by our house. We heard afterwards that the coffin was passed out through the window of the little house. On the other side of the street, waiting for the hearse and carriages to pass, was a uniformed Western Union boy. He hurried over to our house as soon as he could get by and gave mother a telegram. Her favourite cousin had been killed in an accident" (Rhine 1953a: 105-106).

2.2.3. Features of Rhine's Cases

Rhine (1962a: 93) reported that in her collection, which at that stage numbered 7,119 cases, realistic dreams were the most prevalent (43.9%) followed by intuitions (25.8%), unrealistic dreams (20.7%) and hallucinations (9.6%). In an earlier report Rhine (1953a: 82) also examined how many of each form occurred whilst awake or whilst sleeping. Intuitive and hallucinatory cases occurred exclusively whilst awake. The vast majority of unrealistic dreams (97.8%) occurred whilst asleep; a higher proportion of realistic dreams occurred whilst awake (19.4%), with 80.6% occurring whilst asleep. In this report Rhine (1953a: 102) also identified 7.2% of cases as being "indeterminate", which were borderline or contained characteristics of two forms. Furthermore, Rhine (1953a: 102) noted some differences between the types of ESP that occurred in each form, identifying that the proportion of precognitive cases was considerably higher in realistic dreams than in the other three forms, outnumbering other types approximately two-to-one.

Although, as mentioned above, Rhine occasionally commented on different types of ESP (e.g. precognition), most of her work focussed on the forms of ESP and other aspects. This was because Rhine (1962a: 91) identified that all of the four forms occurred in telepathic, clairvoyant and precognitive experiences; as such she did not consider there to be any differences in the psychological processes involved for these different types of experience, and thus felt there was no need to separate cases by type. Rhine (1956: 5-6) also appreciated the difficulty of distinguishing between telepathy and clairvoyance, considering that any case where the percipient's impression was not limited to the item of thought held by the agent could possibly

involve clairvoyance. Some instances occurred where the ostensible ESP information appeared fairly clearly to be the agent's thought, but other aspects, such as the physical body of the agent, may have been included (Rhine 1956: 6). Cases were thus classified as telepathic when the alternative possibility of clairvoyance was less likely, in addition to those where it appeared able to be ruled out altogether. Another aspect of note is Rhine's lack of discussion of retrocognition; in a later article she states that, when her research programme began, telepathy, clairvoyance and precognition were considered to have been established experimentally, and that all of her 15,000 cases could be fitted into one of those types (Rhine 1978: 21). Dobinson (1998: 342) suggests one possible reason for the reluctance of some authors to endorse the possibility of retrocognition is the potential to explain the phenomenon through telepathy or clairvoyance, which may explain Rhine's position in this respect.

Rhine (1962a, 1962b) also examined the factors of completeness of the experiences and the experient's conviction in the truth of their impressions. Completeness was defined as the presence of correct information regarding the nature of the event and the identity of the person or people involved (Rhine 1962a: 97). Realistic dreams had the highest proportion of complete experiences, with 91%, followed by unrealistic dreams (72%), intuitions (55%) and hallucinations (32%; Rhine 1962a: 93). Rhine (1962a: 92) defined a case as demonstrating conviction in situations where participants either stated their certainty that their impression was true, or took some relevant action due to the experience. Rhine did not provide conviction figures for hallucinations, observing that the experient was always convinced that the experience had occurred, but rarely recognised its importance; in those cases where the importance was recognised, it was usually inferred, for example if the experient

perceived their friend they would speculate that they may be in trouble (Rhine 1962a: 102). Rhine (1962a: 103) therefore considered that conviction judgements for hallucinations were not comparable to those of the other forms. For the remaining three forms, intuitions were highest with 84%, followed by realistic dreams (24%) and unrealistic dreams (18%; Rhine 1962a: 94). Thus, higher completeness appeared to correspond broadly with lower conviction.

Of particular relevance to the current thesis, some of Rhine's work focussed on the relationship and activity of the two people involved in apparently telepathic experiences. A close relationship between these people has often been postulated as being necessary for such an experience to occur; for example, at the inception of the SPR, the committee on thought-reading suggested that "consanguinity and familiarity" may be important determinants of success in thought-reading experiments (Barrett, Gurney & Myers 1882: 29). More recently, Lyon Playfair (1999, 2002) noted that the possibility of a psychic connection between identical twins is part of folklore, and reported numerous examples of apparent telepathy between such twins. In her work, Rhine (1953b: 190) examined a subset of her cases that she referred to as "call cases"; these involved the individual experiencing an auditory hallucination of their own name being called, with the call subsequently found to apparently relate to a specific event. Rhine identified 114 cases in which the voice was attributed to a living individual and the action of this individual had been reported. In 56% of cases the agent did indeed call aloud to the percipient, and in 35% of cases the agent did not call, but thought strongly of the percipient (Rhine 1953b: 196). In the remaining 9% of cases, however, the agent did not call or think of the percipient (Rhine 1953b: 197). This suggested to Rhine (1953b: 203-204) that spontaneous ESP experiences do not

originate from an external stimulus in the same manner as sensory perception, but are in fact created by the experient's unconscious. Related to this, Rhine (1962a: 106-7) reported a pain hallucination case in which, while a woman was giving birth, her mother reported experiencing back pain; however, the woman herself did not experience any such pain, and was not aware of consciously thinking about her mother. Rhine (1962a: 107) points out that, in cases such as this, the symptoms are those that the percipient may *expect* the 'agent' to have, rather than those they actually do have. This may further indicate that the percipient is detecting certain aspects, rather than the agent 'sending' them.

In another study, Rhine (1956) examined 328 telepathic cases and found the percipient seemed to be conscious of the agent in 19% of these. In the other 81% they were not conscious of the agent, but Rhine (1956: 8-9) considered that in these cases the percipient could reasonably have been assumed to have had an unconscious orientation towards the agent, otherwise the percipient would never have become aware of the experience; she deemed this to be the case even in instances involving casual acquaintances and strangers, although the motivation for the orientation would likely be "slight and superficial" (Rhine 1956: 21). Regarding the agent, Rhine (1956: 8-9) determined that in 33% of cases the agent was conscious of the percipient, in 51% of cases they were only unconsciously oriented towards the percipient, and in 16% they were neither consciously nor unconsciously oriented towards the percipient. The latter cases, as with some of the call cases discussed previously, suggest that telepathic experiences do not involve the agent simply 'sending a message' to the percipient; the percipient may have the active role, although the fact that the agent does have some orientation towards the percipient in a majority of cases suggests that

both individuals may have the potential to play active roles. Such theorisation, of course, infers that all of Rhine's cases involved ESP; however, as discussed earlier, spontaneous cases cannot be used as evidence for ESP, and it is plausible that errors or omissions in the experience may be due to the entirely coincidental nature of the experience and event. Rhine's tendency to theorise on the ESP process, based on the features of her cases, is discussed further in the next section.

2.2.4. Rhine's Theory of the Experiential Phase of Psi

Rhine (1970: 150) acknowledged that her opinion on the value of spontaneous cases changed during her research; initially intended only as providing suggestions for experiments, she later saw them as demonstrating fundamental concepts of the psi process. Based on her full case collection of over 15,000 items, Rhine proposed that, since telepathy, clairvoyance and precognition seemed to occur under similar circumstances and conditions, they appeared to be different aspects of a single mental ability, differing only in the nature of their targets (Rhine 1978: 21). However, in the case of telepathy, she suggested that the common idea of the agent 'sending' information to the percipient would contradict this idea, since this implies a passive role for the percipient, in contrast to clairvoyance and precognition where the percipient is the active party (Rhine 1978: 22). Based on her findings regarding telepathy cases, where some agents were neither consciously nor unconsciously orientated to the percipient (Rhine 1953b, 1956), Rhine proposed that the percipient was also the active party in these instances; they could obtain information about another person's thoughts just as they could obtain information about an object or future event (Rhine 1978: 22). This suggestion of activity, or at least greater activity,

on the part of the percipient was an important aspect of Rhine's theory. The early SPR members had changed their initial term 'thought-reading' to 'thought-transference', considering that, in experiments at least, the agent's mind was active whilst the percipient's mind was passive (Gurney *et al.* 1886a: 10); however, Rhine (1956: 29) considered that telepathy was indeed more like thought reading.

Rhine's theorisation followed early ideas by researchers such as Tyrrell (1946), who had proposed that ESP experiences involved two stages; firstly, the information became accessible to the individual via a parapsychological process, and secondly, the information was transferred into consciousness via psychological processes termed "mediating vehicles" (Tyrrell 1946: 72). Rhine (1953a: 109, 1978: 23) drew attention to the fact that all forms of ESP experiences - intuitions, hallucinations and dreams - are familiar psychological phenomena, agreeing with Tyrrell's suggestion that while stage 1 is a parapsychological aspect, psi information moves into consciousness using conventional psychological mechanisms; therefore, differences in the form of the experience are not necessarily part of the psi process. Examination of the experiential aspects of spontaneous cases has therefore allowed theorisation on stage 2 of the apparent process, by Rhine and others.

Rhine (1953a: 113) suggested that, after the ESP information arrives unconsciously, it undergoes some form of unconscious judgment process before it becomes consciously available. This potentially explains why individuals' telepathic experiences seem to relate to people who are emotionally or biologically close to them; it is possible that individuals are constantly receiving psi information about a large variety of other individuals and situations, but that this unconscious judgment process selects only

those that are most relevant to the experient. An alternative argument is that individuals who are in close contact are simply more likely to be able to confirm that an event occurred that matched the experience. Rhine (1956: 20) observed some instances of telepathy between strangers, with the confirmation of the experience occurring when they came into each other's presence; she considered that such experiences could easily occur without confirmation and would therefore never be recognised as telepathic. This issue will be returned to later in the chapter.

Rhine (1978: 23) considered that the four forms of ESP experience - intuitions, hallucinations, realistic dreams and unrealistic dreams - were the end result of different unconscious mental processes. Although the sleep/wake distinction was an obvious difference between these forms, many experiences occurred at the border between sleep and wakefulness, and the two dream forms occurred both during sleep and during daydreams; Rhine (1978: 23) therefore suggested that it was the different types of imagery, or the lack of imagery, that differentiated the underlying processes, rather than the state of consciousness of the percipient.

Rhine used the findings from her studies, particularly those examining completeness and conviction (Rhine 1951, 1962a, 1962b), to attempt to identify the kinds of processes involved in this second stage (Rhine 1978: 24-25). Rhine (1978: 25) considered two possible explanations for why information may be incorrect or incomplete; either only incorrect or incomplete information is available to the percipient following "transmission" via ESP (stage 1), or the information is essentially complete and correct but errors arise when the information is transferred into consciousness (stage 2). Based on her observations, Rhine (1978: 25) suggested

that all of the imperfections in cases could be ascribable to psychological influences, and therefore the second scenario was more likely.

Rhine (1978: 25-26) identified that most realistic dreams were complete, but those that were incomplete either contained an incorrect detail among others that were correct, or had a viewpoint that seemed ineffectively chosen and therefore caused the information to be incomplete. Rhine (1978: 26) interpreted this as being due to personal motivations, such as memories and wishes, "contaminating" the psi information; she had earlier noted (Rhine 1953a: 107) that the imagery in these dreams seemed very similar to that of memory, suggesting that the process that produces the imagery experienced when recalling past events may also be in operation during these experiences. Conviction was low, despite the relatively full information usually contained in the dream; Rhine (1978: 26) considered that this could be due to the percipient being consciously aware that dream material is unreliable, or it could occur at an unconscious level as a factor inherent in the psi process.

Unrealistic dreams ranged from slight dramatisation to complete symbolism, but in the less extreme cases Rhine considered again that any imperfection could be due to personal motives (Rhine 1978: 26). As with realistic dreams, unrealistic dreams carried low conviction, but this may be expected given the general lack of correct details in the experiences (Rhine 1978: 26). However, the lack of any apparent correlation between conviction and the amount of information received suggested to Rhine (1978: 26) that information and conviction were independent items, and thus conviction appeared to be an element arising at an unconscious level rather than as the result of a conscious evaluation of the material.

In intuitions that were ‘complete’ (i.e. the agent and event were identified) very little detail was usually included, but there was often strong conviction in the truth of the impression; it appeared as though the meaning of the situation and the conviction in its truth had both passed into consciousness, but some resistance to this transfer had led to a lack of detail (Rhine 1978: 26). This, along with the relatively high proportion of incomplete intuitions, suggested that the transfer into consciousness involved substantial difficulty (Rhine 1978: 26-27). Irrespective of the degree of completeness, appropriate emotion or a compulsion to act was often present, and the conviction rate was high; conviction therefore did not seem to depend on the amount of conscious information received (Rhine 1978: 27). Again, this suggested to Rhine (1978: 27) that the various elements - information, emotion, compulsion and conviction - were separable at the unconscious level, such that they could transfer into consciousness independently of each other; based on the common characteristics of intuitive experiences, it appeared that conviction and emotional elements were able to make this transfer more easily than factual information.

For hallucinations, Rhine (1978: 27) proposed that at the beginning of the second stage, whilst the psi information was still in the unconscious, the information about the agent caused the percipient to create a pseudosensory impression based on their memory of the agent. Since the experience was usually limited to this impression, without any other details such as the event involving the agent, hallucination cases were often incomplete (Rhine 1978: 27). As discussed earlier, conviction was difficult to assess, since the distinction was often unclear between conviction in having the hallucination and conviction that it had a specific meaning (Rhine 1978: 27).

Rhine's observations thus suggested to her that the incompleteness in each form of ESP was a logical result of the type of process producing the form (Rhine 1978: 28). In dreams, that carry their meaning through imagery, incompleteness was due to errors of imagery; in intuitions, where meaning transferred into consciousness directly, incompleteness was due to difficulty in this transfer; and in hallucinations, incompleteness was due to inherent limitations in the range of imagery available to the percipient (Rhine 1978: 28). Conviction appeared to be an independent element; thus it could transfer into consciousness even without the information that would otherwise lead to it, and vice versa (Rhine 1978: 28-29). However, as previously mentioned, Rhine (1978: 26) was aware that the low conviction in dream experiences may be simply because individuals are aware that ordinary dreams consist of fantasy (Irwin & Watt 2007: 37). In addition, Rhine's (1953a: 83) definition of intuitive experiences as "just knowing" something, with its emphasis on knowledge as opposed to a more speculative sensation such as feeling or guessing, means that the feeling of conviction is inherent in the experience as a whole; this needs to be taken into account when relating this aspect to other features of the experiences. Finally, it is worth reiterating that Rhine's theorisation very much infers that all of her cases involved ESP. However, the fact that all forms of ESP experiences are familiar psychological phenomena (Rhine 1953a: 109, Rhine 1978: 23), together with Rhine's (1978: 26) suggestion that memories and desires may "contaminate" the ESP information, raises some doubt as to whether ESP must necessarily be involved; it is entirely plausible that these experiences are in fact wholly fabricated from memories and imagination. Non-ESP explanations for these experiences are discussed in more detail later in the chapter.

2.3. Schouten's Reanalyses of Three Case Collections

2.3.1. Schouten's Pragmatic Approach

Following Rhine's work, Sybo Schouten conducted extensive quantitative reanalyses of the cases from *Phantasms of the Living* (Schouten 1979), Rhine's case collection (Schouten 1982) and another case collection by the German researcher Sannwald (Schouten 1981). Schouten (1983: 325-326) termed the *Phantasms* and Rhine studies as taking the "metaphysical approach", in that they were both based on the premise that ESP existed. However, Schouten saw ESP instead as a hypothesis, preferring to take what he referred to as the *pragmatic approach*, stating: "The pragmatic approach is based on the notion that all human experiences and activities are a legitimate subject for scientific research, including such human experiences as those found in spontaneous cases. These experiences have at least one common property, namely, that the persons who reported these cases felt that these experiences were something special, that they had a paranormal character. It is a legitimate scientific question to ask why those persons, who must have had numerous 'normal' experiences in life, singled out one or a few of these and attributed a paranormal character to them" (Schouten 1983: 327). However, as with Rhine, Schouten (1979: 411) also considered the cases as providing suggestions for hypotheses that could be tested in experimental research; he further argued that quantitative analysis of cases could actually test the validity of some hypotheses even without experimentation, such as the existence of reporting effects or cultural differences in case features (Schouten 1982: 115). Schouten (1983: 329) saw the cultural aspect as key; in a specific culture, people may expect paranormal experiences to occur in a certain form, and so may interpret ordinary experiences as paranormal if they fit these expectations. Cultural

trends may thus be due to such common attributions, and one would expect case collections from different eras and cultures to contain different properties (Schouten 1983: 329).

Phantasms of the Living has the advantage of containing authenticated cases, but has the disadvantage of only containing telepathy cases, defined arbitrarily as those in which the time between the experience and event was less than 12 hours (Gurney *et al*. 1886a: xix). Requests were made for "apparitions at or after death, and other abnormal occurrences" (Gurney *et al*. 1886a: lxi), suggesting a bias towards death cases but also an acceptance of other apparently inexplicable experiences (Schouten 1981: 14). Schouten included 562 of the 712 cases in his analyses; those removed were either experiments, contained very little detail, were reciprocal (e.g. two strangers dreaming of each other and subsequently meeting), or lacked an event (Schouten 1979: 412).

Sannwald's (1961 cited in Schouten 1981: 11) collection consisted of 1,000 cases of telepathy, precognition and clairvoyance, reported to the University of Freiburg, Germany, between 1950 and 1959. Sannwald excluded cases that were deemed too old, as well as cases that could potentially be explained by normal means, such as a situation developing in a predictable manner, perception errors, incorrect reporting, or coincidence (Schouten 1981: 11-12). Schouten included 789 of the cases in his analysis, removing those with too little detail, those that were second- or third-hand, and those that seemed to be provided by professional mediums; he also excluded clairvoyance cases and precognition cases that concerned general events, to ensure

that the cases were equivalent to *Phantasms* in having events that concerned a particular person (Schouten 1981: 15-16).

As discussed earlier, Rhine's cases were mainly collected during the 1940s, 1950s and 1960s (Schouten 1982: 116). By the late 1960s Rhine had collected over fifteen thousand cases and had ceased active collecting (Rhine 1969: 230); 10,772 of these cases were available to Schouten for reanalysis (Schouten 1982: 116), of which a selection of 1,630 were analysed (Schouten 1982: 119). Rhine's cases were not authenticated, but as a test of the value of authentication, Schouten (1979: 445) carried out all of his analyses on a selection of 160 *Phantasms* cases where individuals other than the agent or percipient supplied statements corroborating the occurrences of the event and experience. Although there were some minor differences, Schouten (1979: 448) found that all of the analyses showed the same directions of results as for all cases, suggesting that the results were not influenced by unreliable reporting from non-corroborated cases (Schouten 1979: 450), and potentially vindicating the more relaxed case collection approach of Rhine.

Clearly there are important differences in these collections. The *Phantasms* collection was obtained in Britain in the late nineteenth century, Sannwald's cases were from Germany in the early-to-mid twentieth century, and Rhine's cases were from the USA in a similar period. More than half of the Sannwald cases are from a period of Nazi rule in Germany, and thus this collection contains a relatively large proportion of events relating to war (Schouten 1981: 12). In contrast, Rhine's collection, although also spanning the Second World War, contained less than 6% of war cases (Schouten 1982: 117). In addition, the contributors to *Phantasms* appear to have been largely

educated and intelligent, whilst those in the collections of Sannwald and Rhine were largely "common" (Schouten 1981: 13, Schouten 1982: 118). As discussed earlier, the selection process for the *Phantasms* cases was also more rigorous than that for the other two collections (Schouten 1981:13), although it seems that authenticated cases were little different from those that were not authenticated (Schouten 1979: 450). While the concept of spontaneous telepathy was rarely acknowledged by *Phantasms* respondents, it appeared to be more familiar to those in the collections of Sannwald and Rhine (Schouten 1981: 13, Schouten 1982: 118).

There is also an important similarity between the *Phantasms* and Sannwald collections, in that the cases contain ESP experiences related to another person; thus, conclusions from these collections may not be applicable to ESP experiences such as clairvoyance or cases of precognition related to general events (Schouten 1981: 14). The Rhine collection contained a larger proportion of non-telepathy cases, with 19.9% of Schouten's sample involving an experience related to the percipient, and 4.1% involving an experience relating to a general event (Schouten 1982: 119). Due to the difficulty of distinguishing between telepathy and clairvoyance cases, the latter were treated as telepathy where possible; thus the term GESP (General ESP) would be more appropriate than telepathy for these cases (Schouten 1982: 120). A small proportion of Sannwald's collection were cases of precognition, but Schouten (1981: 41) found no differences between telepathy and precognition cases; however, the greater proportion in Rhine's collection allowed some discrepancies to become apparent (Schouten 1982: 149), which are detailed later.

In some instances, Schouten provided figures for all three collections, and in the remainder of this chapter the key figures are tabulated for comparison purposes. In other instances, Schouten provided detailed figures for the *Phantasms* collection only, and simply commented that the other collections provided similar results; thus, in the subsequent discussion, figures are not always presented for all three collections. Schouten also largely compared the Sannwald and Rhine collections to *Phantasms*, but not to each other. Most of the analyses, unless otherwise stated, are based on cases involving an agent, i.e. a "target person" who was not the percipient (Schouten 1982: 120). The term "target person" may be preferable to "agent", particularly in cases of precognition where agency on the part of the person seems less likely.

2.3.2. The Percipient

The sexes of percipients are shown in Table 2.1. All three collections had significantly higher proportions of female percipients (Schouten 1979: 414, Schouten 1981: 17, Schouten 1982: 121), and this was demonstrated not to be due to a difference in population distribution, women being dominant in one specific type of relationship such as mothers receiving impressions about their children, or differences in the genders' propensity to report experiences (Schouten 1979: 414-417, Schouten 1981: 18-20, Schouten 1982: 121). Schouten (1979: 417) thus argued that the larger number of female percipients may be related to the ESP process; however, he did not appear to consider that this result may be due to sex differences in personality or cognition, such as a possible tendency for females to be more likely than males to interpret coincidences as meaningful.

Table 2.1. Sexes of percipients in the *Phantasms of the Living*, Sannwald and Rhine spontaneous case collections (Schouten 1979: 414, Schouten 1981: 17, Schouten 1982: 121).

Collection	Phantasms	Sannwald	Rhine
Male percipient (%)	43.8	25.7	16.7
Female percipient (%)	56.2	74.3	83.3

The Sannwald collection was significantly more female-dominated than *Phantasms*, seemingly due to war cases being especially likely to have a female percipient, but even the non-war cases had a noticeably higher female bias than the *Phantasms* collection (Schouten 1981: 17-18). There were also more females overall involved in the collection, either as percipient or target person, than in the *Phantasms* cases, potentially indicating a reporting effect (Schouten 1981: 18); Schouten (1981: 39) suggested this may be due to differences in the way the cases were collected, such as the *Phantasms* collection being obtained in the largely male-dominated intellectual circles of the time. The Rhine collection was also significantly more female-dominated than *Phantasms*; this did not seem to be due to the inclusion of precognition cases in the Rhine collection, but it appeared that females were more inclined to report cases than males (Schouten 1982: 121-123), whereas the opposite was true for *Phantasms* (Schouten 1979: 416).

2.3.3. The Target Person

The sex of the target person is shown in Table 2.2. All three collections had significantly more male target persons than female, and there were no significant differences between the collections (Schouten 1979: 417, Schouten 1981: 20, Schouten 1982: 124). This pattern was found across the different types of

relationships, with the exception of children having an experience related to one of their parents, for whom the target person was more often the mother, in between 51.3% and 57.1% of cases respectively (Schouten 1979: 417-418, Schouten 1981: 20-21, Schouten 1982: 124-125). Thus, in contrast to the varying results for the percipient, the results for the target person are remarkably consistent across the three collections.

Table 2.2. Sexes of target persons in the *Phantasms of the Living*, Sannwald and Rhine spontaneous case collections (Schouten 1979: 417, Schouten 1981: 20, Schouten 1982: 124).

Collection	Phantasms	Sannwald	Rhine
Male target (%)	64.6	69.1	64.2
Female target (%)	35.4	30.9	35.8

For the *Phantasms* and Sannwald collections, the generally larger proportion of male target persons did not seem to be due to a reporting effect, a difference in population distribution, or a tendency for males to be involved in more serious incidents than females (Schouten 1979: 418-419, Schouten 1981: 21). However, war cases were significantly more likely to have a male target person than non-war cases, since many of these cases involved the fate of soldiers (Schouten 1981: 43-44). For the Rhine collection, males were significantly more likely to be involved in serious events than females, although this was a rather weak association, it was not present when only precognition cases were examined, and it was found but to a non-significant level in *Phantasms* (Schouten 1982: 142, 149); therefore Schouten (1982: 125) did not consider this as likely to explain the excess of male target persons.

2.3.4. The Relationship Between the Percipient and the Target Person

In all three collections, close family relationships (spouses, parent/child pairs and siblings) were most common, followed in order by friends and acquaintances, other family members, and strangers (Schouten 1979: 420, Schouten 1981: 22, Schouten 1982: 126; see Table 2.3). However, *Phantasms* and the Rhine collection were significantly different, with the latter including relatively fewer cases between friends and acquaintances and more cases between close relatives; this was not due to the inclusion of precognition cases in the Rhine collection (Schouten 1982: 125).

Table 2.3. Relationships between target persons and percipients in the *Phantasms of the Living*, Sannwald and Rhine spontaneous case collections (Schouten 1979: 420, Schouten 1981: 22, Schouten 1982: 126).

Collection	Phantasms	Sannwald	Rhine
Close family (%)	51.6	55.9	65.4
Other family (%)	13.4	11.0	12.6
Acquaintances (%)	32.8	28.0	20.4
Strangers (%)	2.2	5.1	1.6

Schouten (1979: 419) was aware of the fact that the likelihood of detecting a case should be higher for individuals who know each other better. He therefore examined cases involving the death of the target person, excluding strangers, with the rationale that the probability of learning of the death of the target person must have been very high and relatively equal across the remaining three groups (Schouten 1979: 420). However, for *Phantasms* and the Sannwald collection, the relative incidence of death cases involving these three groups remained very similar to the incidence for the

whole case collection (Schouten 1979: 420-421, Schouten 1981: 22). For the Rhine collection, there was some evidence of a significantly higher frequency of non-serious cases occurring between close relatives (Schouten 1982: 126) but Schouten (1982: 128) considered that this only played a minor role.

Schouten (1979: 421) also suggested that differences in population size for the different groups were unlikely to be the cause, since one would generally expect there to be a higher number of friends and acquaintances than close family members, an opposite pattern to that found. Schouten further considered the possibility that the death of relatives may impress the people involved more than non-relatives and therefore be sooner reported; however, examining cases of death reported by someone other than the percipient showed no significant differences between family members and outsiders in terms of their reports of the types of relationship between target person and percipient, suggesting that the finding of more cases involving family members is not due to a reporting effect (Schouten 1979: 421-422, Schouten 1981: 22, Schouten 1982: 128).

Schouten also suggested that percipients may report a case sooner when relatives rather than outsiders are involved, and compared death cases reported by the percipient with death cases reported by others. For the Sannwald collection, there was no significant difference between these two groups in terms of the different types of relationships involved in the experiences; percipients and others were both more likely to report experiences involving close family members (Schouten 1981: 22). For *Phantasms*, a significant result was obtained but the result was opposite to that expected; percipients were more likely to report experiences involving friends and

acquaintances, whilst others were more likely to report experiences involving close family members (Schouten 1979: 422). The same result was present in the Rhine collection, but was not significant (Schouten 1982: 128). Schouten (1979: 422) suggested this may reflect a different type of reporting effect, namely reluctance of percipients to report a case involving death of a near relative on the grounds that it would be inappropriate to treat it as a case for scientific inquiry; however, this reluctance does not seem to have been present in the Sannwald collection (Schouten 1981: 23). This difference between these collections did not appear to be due to the inclusion of more war cases or different types of ESP in the Sannwald collection, suggesting a genuine difference between the collections (Schouten 1981: 23).

More in-depth analyses of *Phantasms* cases between close family members (spouses, parent/child and siblings) demonstrated that most pairings followed the pattern of the overall set, with more females as percipients and more males as target persons. This pattern was strongest in cases with parents as percipients and children as targets; the mother (70.5%) was most commonly the percipient and the son (85.2%) most commonly the target (Schouten 1979: 423-424). However, in the opposite situation, with parents as targets and children as percipients, the figures were more balanced with the direction reversed very slightly; the target was more frequently the mother (53.0%) than the father, and the son was more frequently the percipient (53.0%) than the daughter (Schouten 1979: 423-424).

To Schouten, these findings highlighted a number of suggestions about the ESP process; females may simply be more capable of receiving ESP impressions, while it may be easier for a percipient to have an ESP experience when the target is male

(Schouten 1979: 424-425). Schouten (1979: 425) accepted that some individuals (females, in this case) may have better ESP ability than others, but deemed it less probable that events involving males should somehow be less likely to be detected by ESP than those involving females; Schouten's thinking on this matter would seem to imply a theory of ESP similar to that of Rhine (1978: 22), where the percipient is the more active member of the pairing. Based on these findings, Schouten (1979: 425-426) proposed a speculative hypothesis that, in a mutual emotional relationship, the probability of becoming the percipient in an ESP experience is higher for the partner who is more emotionally dependent, while the probability of becoming the target is higher for the other partner. Considering that the collection of the *Phantasms* cases occurred during the Victorian era, Schouten (1979: 426) suggested that the male-dominated society led to more emotional dependence on males, hence the generally higher prevalence of males as targets and females as percipients. In situations with children as percipients, Schouten (1979: 426) argued that children may be more emotionally dependent on their mother, hence the slightly higher frequency of mothers as targets; the more even distribution of sons and daughters as percipients suggests there is no difference between these in terms of their emotional dependence on their parents. However, there is a slight discrepancy here; Schouten appears to consider a figure of 53.0% of sons being the percipient as indicative of equality between sons and daughters, yet interprets an identical figure of mothers being the target as indicative of more emotional dependence on the mother. Based on Schouten's hypothesis, these figures would in fact indicate that children show emotional dependence on their mother and father fairly equally.

For Sannwald's cases, again parent percipient-child target pairings had the highest proportion of female percipients (90.1%) and a high proportion of male targets (81.2%), although spouses had a higher proportion of husbands as the target (86.8%; Schouten 1981: 24). Again, child percipient-parent target pairings went most against the overall result; mothers were more likely to be the target (55.7%) than fathers, and sons were the percipient in 40.0% of cases, which was noticeably higher than the overall male-percipient figure of 25.7%, although not a reversal of the result (Schouten 1981: 24). Using these data on the cases between close relatives, Schouten (1981: 24) subsequently performed a Spearman rank correlation between the distributions of the *Phantasms* and Sannwald collections, finding a significant positive relationship and arguing that the results of the Sannwald collection thus confirmed the findings of the *Phantasms* analysis. However, Schouten did not address the issue that the Sannwald collection was obtained many years after the Victorian era and thus may have been collected in a time of different within-family dynamics.

For the Rhine collection, again parent percipient-child target pairings had a high proportion of female percipients (88.2%), although this was slightly lower than that for spouses (88.6%; Schouten 1982: 129). However, the proportion of son targets in parent percipient-child target pairings (66.6%) was only slightly above the overall value of 64.2%; the highest proportion of male targets was for spouses (88.6%; Schouten 1982: 128-129). Child percipient-parent target pairings went most against the overall result in terms of the target, which was the mother in a slight majority of cases (50.8%; Schouten 1982: 129). However, in terms of the percipient, sibling pairings went most against the strongly female-biased overall result, with 20.3% of cases having the brother as the percipient; Schouten (1982: 129) thus considered that

the mutual attachment between parents and sons apparent in the *Phantasms* collection had subsequently diminished, but considered the mother as having retained her "special status".

2.3.5. Nature of the Experience

The frequencies of the forms of experience are shown in Table 2.4. Unlike Rhine (1953a), Schouten did not separate dreams into realistic and unrealistic forms, but did further separate hallucinations into three forms, namely visual, auditory, and those with a combination of visual and auditory aspects (Schouten 1979: 427). This separation was not made when re-analysing the Rhine collection, with no explanation given. However, the larger proportion of precognition cases in Rhine's collection allowed separation of these cases into telepathy and precognition groups (Schouten 1982: 150).

For *Phantasms*, hallucinations were most common (Schouten 1979: 427), but for the Sannwald collection these were much less prevalent, with dreams most frequent (Schouten 1981: 25). The order of prevalence for Rhine's collection was also significantly different from *Phantasms*, matching that of Sannwald, but with relatively fewer dreams and more intuitions and hallucinations (Schouten 1982: 130). Schouten (1982: 140) considered these results indicative of true cultural differences between the collections, but also due to the *Phantasms* investigators using the specific term 'apparitions' when soliciting cases (Schouten 1981: 34). As discussed earlier, Schouten (1983: 329) considered that case collections from different eras and cultures would be likely to differ, due to differences in the forms that individuals expect

paranormal experiences to take. This argument is plausible, and is put forward by other researchers (e.g. Irwin & Watt 2007: 224), but Schouten does not provide any further evidence for why it necessarily explains these specific differences in the cases. In particular, the use of the term 'apparitions' by the *Phantasms* investigators when soliciting cases would seem a more likely cause of the differences between this collection and those of Sannwald and Rhine. Irwin and Watt (2007: 34) refer more generally to the fact that, if a researcher provides examples of the forms of experience they are collecting, they are likely to receive a higher proportion of experiences with forms matching those of the provided examples. It is unclear whether such examples were provided to participants in the Sannwald and Rhine collections, but this provides a possible alternative explanation to Schouten's (1982: 140) cultural interpretation.

Table 2.4. Frequencies of the forms of experience in the *Phantasms of the Living*, Sannwald and Rhine spontaneous case collections (Schouten 1979: 427, Schouten 1981: 25, Schouten 1982: 130, 150).

Collection	Phantasms	Sannwald	Rhine (all)	Rhine (telepathy)	Rhine (precognition)
Intuitions (%)	9.6	23.6	33.6	36.8	26.0
Dreams (%)	33.5	59.0	41.7	33.1	62.3
Hallucinations (%)	54.0	10.9	20.9	25.4	10.1
- Visual (%)	*41.2*	*7.5*	-	-	-
- Auditory (%)	*10.5*	*3.2*	-	-	-
- Visual and auditory (%)	*2.3*	*0.2*	-	-	-
Others (%)	3.0	6.6	3.8	4.7	1.6

For Rhine's collection, important differences were found between telepathy and precognition cases; intuitions were the most common form of telepathic experience, while dreams were the most common form of precognitive experience (Schouten 1982: 149-150). This apparent association between type of ESP and form of experience may be a further explanation as to why case collections differ in the frequencies of the different forms, in addition to factors such as culture and the example experiences provided to participants; if collections are biased towards particular types of ESP then they may be expected to be biased towards particular forms of experience. It is therefore clearly important to consider differences between the different types of ESP where possible.

The form of experience was not related to the sex of the percipient or target (Schouten 1979: 427, Schouten 1981: 25, Schouten 1982: 130-131). Dream experiences were largely restricted to the night time, as expected (Schouten 1979: 427). For *Phantasms*, there was no other apparent influence of time of day (night, morning, afternoon, evening) on the form of experience (Schouten 1979: 427). For the Sannwald and Rhine collections, there appeared to be significant associations; intuition cases occurred more often during the morning and afternoon compared to the night or evening (Schouten 1981: 25-26, Schouten 1982: 141), whereas hallucinations were approximately equally distributed over the different times of day (Schouten 1981: 35). However, subsequent reanalyses suggested these findings may be artifactual, and that in fact intuitions are approximately equally spread over the day, with hallucinations more common in the evening and night, matching a non-significant result in *Phantasms* (Schouten 1981: 35, Schouten 1982: 141). However, these reanalyses considered there to be eight hours during the night when the percipient was asleep and

thus unable to experience intuitions or hallucinations, whereas Schouten (1981: 35) concedes that one may, for example, wake up and then have an experience whilst awake.

When dreams were excluded, there was a striking difference in terms of the number of experiences occurring at different times of day (Schouten 1979: 427), both within and between collections. For *Phantasms* and the Rhine collection most experiences took place in the evening or night (Schouten 1979: 428, Schouten 1982: 131), while for the Sannwald collection most experiences took place in the morning or afternoon (Schouten 1981: 26). There were no differences between the sexes in this respect (Schouten 1979: 429, Schouten 1981: 26, Schouten 1982: 132). When comparing *Phantasms* and the Sannwald collection, Schouten (1981: 26) argued that the difference between these collections appeared mainly due to the fact that intuitions occur more commonly during the daytime, with hallucinations occurring more commonly at night (although a potential issue with these analyses of form of experience and time of day has been mentioned above). However, like the Sannwald collection, the Rhine collection also had considerably fewer hallucinations than *Phantasms* yet still showed a similar result to the latter, suggesting that Schouten's argument is not wholly supported.

From the results from *Phantasms*, Schouten (1979: 428) suggested that the figure for night-time experiences would be the largest if dreams were included; on this basis, he argued that these results provide evidence for ESP being facilitated by reduced sensorial input, similar to the evidence from experimental research that suggests the psi-conduciveness of simple relaxation (Honorton 1974: 248) and altered states of

consciousness such as hypnosis, dreaming and meditation (Honorton & Harper 1974: 156-157). Schouten (1979: 428) also proposed that a similar effect may be seen across seasons, with more experiences in the darker months of autumn and winter than in spring and summer; there was a noticeable result in this direction, but this was non-significant, and season was not related to the form or time of day of the experience. Similar non-significant findings were obtained for the Sannwald and Rhine collections (Schouten 1981: 26, Schouten 1982: 131), with the finding of more daytime experiences in the former potentially casting doubt on Schouten's (1979: 428) suggestion of the need for reduced sensorial input.

Excluding dreams, there was no difference between the forms of experience in terms of whether they occurred indoors or outdoors, for *Phantasms* and the Sannwald collection (Schouten 1979: 428-429, Schouten 1981: 26). However, there was a significant association for the Rhine collection, where hallucinations were strongly related with being indoors; this was independently significant for the telepathy cases but not for those of precognition (Schouten 1982: 131-132). In all three collections males were significantly more likely to have an experience whilst outdoors (Schouten 1979: 429, Schouten 1981: 26, Schouten 1982: 132), probably due to different lifestyles (Schouten 1981: 41).

For *Phantasms*, the social situation of the percipient (alone or with others, again excluding dreams) did not differ across the forms of experience (Schouten 1979: 429). However, there were significant differences in the Sannwald collection, where intuitions occurred approximately three times more often when in company than when alone (Schouten 1981: 26-27), and in the Rhine collection, where hallucinations

occurred almost four times as often when alone than when in company (Schouten 1982: 132).

Schouten thus identified that a number of situational factors did not appear to affect the form of the ESP experience, and proposed instead that the content of the ESP 'message' may be more important in this respect; for example, more serious events may be relayed in a less informative form as a protective measure (Schouten 1979: 429). To test this hypothesis, Schouten compared deaths with non-serious events (light injuries, trivial and positive), excluding serious illness due to the difficulty in locating the event exactly in time (Schouten 1979: 429). For all three collections hallucinations had the highest ratio of death cases to non-serious events; this was significant for *Phantasms* but not for the Sannwald or Rhine collections (Schouten 1979: 430, Schouten 1981: 27, Schouten 1982: 132), a difference that Schouten (1982: 132) suggested was due to the *Phantasms* authors' focus on apparitions of the dead and dying. Schouten (1979: 430) therefore argued that his hypothesis was not supported, since deaths were associated with "the most informative" form of experience; however, subsequent analyses suggested that hallucinations are most informative only in terms of identification of the target person (Schouten 1979: 443), so it is not clear how Schouten came to this interpretation (events and the content of the experience are discussed in more detail in subsequent sections). Whilst a relationship between the form of experience and the type of event is potentially encouraging, Schouten (1979: 430) suggested that more examination was needed of percipients and laboratory participants in terms of psychological variables such as their propensity to experience imagery and intuitions.

2.3.6. The Event

Schouten placed events into several categories; these are shown, along with their frequencies, in Table 2.5. Death cases dominate in all three collections, with the order of prevalence broadly similar; again, Schouten (1981: 34) suggested that the particularly high proportion of death cases in *Phantasms* was likely due to the authors' specific interest in apparitions around the time of death, or the higher mortality rate of the late nineteenth century (Schouten 1979: 432). Schouten (1979: 432) particularly commented on the very low proportion of cases covering material damage, even allowing for the *Phantasms* collection's focus on telepathy cases, and proposed that this further indicated the importance of the target person and their role in the relationship with the percipient.

Although following similar patterns, *Phantasms* and the Sannwald collection were significantly different due to the latter's higher proportions of trivial and positive cases (Schouten 1981: 28); further analysis showed that war cases involved fewer trivial events but were associated more with positive events, compared to non-war cases (Schouten 1981: 29). One would thus expect the presence of war cases to diminish the number of trivial events, so the relatively high proportion of the latter suggests a general tendency for Sannwald's collection to contain more of these events than *Phantasms* (Schouten 1981: 40). Rhine's collection also differed significantly from *Phantasms*, with fewer death cases and more serious accidents and slight injuries (Schouten 1982: 133). Telepathy and precognition cases also differed significantly, with precognition cases involving relatively more deaths and fewer non-serious events (Schouten 1982: 133-134). Precognition cases also showed a strong association

between dreams and non-serious events, whereas no such association existed for telepathy cases (Schouten 1982: 149-150).

Table 2.5. Frequencies of the events in the *Phantasms of the Living*, Sannwald and Rhine spontaneous case collections (Schouten 1979: 432, Schouten 1981: 29, Schouten 1982: 133, 151).

Collection	Phantasms	Sannwald	Rhine (all)	Rhine (telepathy)	Rhine (precognition)
Death (%)	66.7	48.7	37.7	32.9	49.0
Serious illness/ accidents (%)	12.5	13.7	27.5	27.6	27.5
Slight injuries (%)	8.7	9.2	18.5	22.3	9.5
Material (%)	0.7	3.0	0.9	0.9	0.8
- *Serious (%)*	*0.5*	*2.5*	*0.3*	-	-
- *Slight (%)*	*0.2*	*0.5*	*0.6*	-	-
Trivial (%)	10.0	14.1	10.8	12.7	6.5
Positive (%)	1.4	11.2	4.5	3.6	6.5

To examine the reason for the high frequency of negative events, Schouten compared serious events with non-serious events in terms of the time elapsed between the event and the report being received. He found evidence that relatively more non-serious events were reported within a year of their occurrence, whereas relatively more deaths were reported when the time elapsed was longer than a year; this was significant for *Phantasms* and the Rhine collection, but not for the Sannwald collection (Schouten 1979: 433, Schouten 1981: 29-30, Schouten 1982: 134). This suggests a reporting

effect where people more quickly forget less serious events (Schouten 1979: 433). Schouten also compared deaths and non-serious events in terms of the person who contributed the case (excluding the target persons). For *Phantasms*, a significant result was found; for both deaths and non-serious events the majority were reported by the percipient, but 44.8% of death cases were reported by another person, in comparison to just 6.6% of non-serious cases (Schouten 1979: 433-434). The same significant result was found in the other collections (Schouten 1981: 30, Schouten 1982: 134). This suggests another reporting effect, where non-percipients are much less likely to report experiences relating to non-serious events (Schouten 1979: 434).

Despite these apparent reporting effects, Schouten (1979: 434) considered that the very low proportions of cases involving positive events and material damage indicated that an ESP-related variable must be involved. Schouten (1979: 434) proposed that ESP experiences mainly concern events related to a person because these events are generally more important to the relationship between the target person and percipient, compared to material events. More specifically, Schouten (1979: 434-435) hypothesised that events posing a greater threat to the relationship would be more likely to be represented as an ESP experience; although positive events and serious material damage may be striking, they generally do not pose a threat to the relationship.

2.3.7. Content of the Experience

Table 2.6 shows the proportions of experiences in which the target person and event were identified. In all three collections, the target person was identified in around

four-fifths of cases (Schouten 1979: 435, Schouten 1981: 30, Schouten 1982: 134). For *Phantasms*, the event was correctly identified in around half of the cases, significantly less often than the target person (Schouten 1979: 435). This suggested to Schouten (1979: 435) that the most important aspect of the ESP information is that something (usually negative) has happened to the target person, irrespective of the specific details; Schouten (1979: 435) took this as further evidence for his hypothesis that ESP largely provides information about a threat to the relationship between the target person and percipient. However, for the Sannwald collection, event identification was only slightly lower than that for the target person, and was significantly higher than for *Phantasms* (Schouten 1981: 30), potentially suggesting more importance for the event than Schouten originally proposed. For the Rhine collection, the event was also identified significantly more often than in *Phantasms* (Schouten 1982: 134). For telepathy cases only, the figure decreased to 59.5% and the result became only marginally significant; however, for precognition cases (78.7%) the value was significantly higher than for telepathy (Schouten 1982: 134).

Table 2.6. Identification of the target person and event in the *Phantasms of the Living*, Sannwald and Rhine spontaneous case collections (Schouten 1979: 435, Schouten 1981: 30, Schouten 1982: 134).

Collection	Phantasms	Sannwald	Rhine
Target person identified (%)	81.7	79.6	78.5
Event identified (%)	51.9	72.8	65.2

In the Rhine collection there was a significant association between identifying the target person and taking action (Schouten 1982: 135), but such an association was not present in *Phantasms* or the Sannwald collection (Schouten 1979: 436, Schouten

1981: 31). Action was more rarely taken for death cases than non-death cases, presumably because in the former action often could not be taken, and the lower proportion of deaths in Rhine's collection may explain this discrepancy between the collections (Schouten 1982: 143-144). Instances where the target person focussed on the percipient were examined for *Phantasms* only; focussing was not related to the taking of action by the percipient (Schouten 1979: 436-437). Dreams were most associated with identification of the event, while hallucinations were most associated with identification of the target person (Schouten 1979: 443); the prevalence of dreams in precognitive cases would thus seem to explain the higher event identification in precognitive experiences (Schouten 1982: 150-151). Intuition cases were related to higher conviction (Schouten 1979: 438) and more likelihood of taking action; for *Phantasms*, action was taken in 32.0% of intuition cases, 13.8% of hallucinations and 12.0% of dream cases (Schouten 1979: 437), with similar findings for the Sannwald and Rhine collections (Schouten 1981: 31, Schouten 1982: 135).

Males and females did not differ in terms of their identification of the target person or event (Schouten 1979: 435-436, Schouten 1981: 30-31, Schouten 1982: 135). Schouten (1981: 31) interpreted this as supporting his view that the difference between the number of male and female percipients was not due to differing ESP ability between the sexes. In *Phantasms* and the Rhine collection, there were marginally significant results where males showed more conviction than females, and took action more often (Schouten 1979: 436, Schouten 1982: 135). For *Phantasms*, Schouten (1979: 436) interpreted this as being due to the prevailing social situation at the time, where males were more inclined to take the initiative than females, but this

may not explain the similar findings in Rhine's cases. In the Sannwald collection there were no such differences between the sexes (Schouten 1981: 31).

Schouten also examined how detailed the experiences were, and how many of the details were correct and incorrect. However, incorrect details were rarely reported, suggesting that contributors were simply reporting those details from the experience that were found to match the event; Schouten's analyses were thus restricted to correctly perceived details (Schouten 1979: 438). Issues also arose due to the difficulty of defining a detail, the tendency for the percipient to have already had some knowledge of the target person's situation and thus built this into the description of their experience, and the possibility of the report changing with multiple retellings (Schouten 1979: 438-439); Schouten (1979: 439) therefore accepted that the number of correct details reported was likely to be inflated. Despite this, the number was rather low, with the proportion of cases containing at least one detail at just 32% for Phantasms (Schouten 1979: 439), although slightly higher at 52% for the Sannwald cases (Schouten 1981: 32) and higher still at 56% for Rhine's collection (Schouten 1982: 137). For the latter, precognitive experiences contained significantly more details than telepathic ones (Schouten 1982: 137).

For *Phantasms* and the Rhine collection, the number of details was not related to the length of time that had elapsed before reporting the case, suggesting that details were not forgotten over time (Schouten 1979: 439-440, Schouten 1982: 136). However, there was evidence of forgetting in the Sannwald collection; reports of older cases were shorter in length and contained fewer details (Schouten 1981: 32). This seemed to be largely due to the fact that trivial and positive cases, which were more detailed

than the other types, were generally more recent (Schouten 1981: 32). Longer reports contained significantly more details, but it was unclear whether this was due to different writing habits or to the fact that describing more details required a lengthier report (Schouten 1979: 440, Schouten 1981: 32, Schouten 1982: 136).

For *Phantasms*, dreams were the most detailed experiences, with 52.9% containing at least one detail, followed by intuitions (30.9%) and hallucinations (19.1%; Schouten 1979: 441); a similar result was obtained for the other collections (Schouten 1981: 32, Schouten 1982: 136). The prevalence of dreams in precognition cases would thus appear to explain their higher number of details than telepathic cases (Schouten 1982: 151-152). Identification of the target person was not associated with number of details, but significantly more details accompanied identification of the event (Schouten 1979: 442, Schouten 1981: 33, Schouten 1982: 137). For *Phantasms*, 62.8% of experiences regarding non-serious events contained at least one detail, but this figure was only 20.0% for deaths (Schouten 1979: 441-442); a similar result was obtained for the other two collections (Schouten 1981: 32, Schouten 1982: 136). There was no difference in the number of details for male and female percipients (Schouten 1979: 442, Schouten 1981: 32, Schouten 1982: 137), a finding that Schouten (1982: 137) interpreted as further evidence that the sexes do not differ in ESP ability, and thus that the excess of female percipients must be due to other factors.

Schouten (1979: 443) considered this set of findings as demonstrating that the identification of the target person comes largely in an all-or-nothing manner, most often in a hallucination, but that details may be included based on the percipient's

knowledge and expectations regarding the target's situation. However, whilst the identification of the target person is sufficient in itself, the nature of event identification is often associated with inclusion of some details (Schouten 1979: 443). Schouten (1979: 444) suggests that, in the case of less serious events, more details may be needed to even recognise the experience as potentially extrasensory; this would seem to correspond with the finding that non-serious events are associated with more details. However, Schouten (1979: 444) also argues that details have the function of conveying the meaning of the information; with death cases, the death itself is the key aspect, whilst in less serious events the details are more important in conveying meaning. Schouten (1979: 444) thus argues that, as with identification of the target person, identification of the event also comes largely in an all-or-nothing manner.

Schouten also examined the relationship between conviction and number of details, finding that significantly more conviction cases occurred when there were no details in the experience (Schouten 1979: 444, Schouten 1981: 33, Schouten 1982: 138). He argued that this contradicted the assumption that conviction is based on a considered response to the experience, in which case there would be a positive correlation between number of details and conviction; as such, he argued that this finding supported Rhine's (1978) suggestion that conviction is a separate element (Schouten 1979: 444). This was further bolstered by the finding that conviction and taking action were not related to identification of the event (Schouten 1982: 138).

2.3.8. Distance

For *Phantasms* and the Sannwald collection, Schouten separated cases into those where the target person and percipient were in the same country, and those where they were not. For the Rhine collection, due to the distances within the USA being generally larger than those in Europe, Schouten (1982: 138) included an additional category where the target person and percipient were in different states; for some analyses he compared target-percipient pairs in the same town or state with pairs in different states or countries. Significantly more non-serious cases occurred at closer distances, probably due to the greater probability of detecting a case (Schouten 1979: 444-445, Schouten 1981: 33, Schouten 1982: 138). Cases involving longer distances happened significantly more often between close family members, again probably due to more frequent contact and thus greater probability of detection (Schouten 1979: 445, Schouten 1981: 33-34, Schouten 1982: 138). For the Rhine collection, longer distances were associated with fewer details (Schouten 1982: 139); there was a non-significant result in this direction for *Phantasms* (Schouten 1979: 445), and no such association in the Sannwald collection (Schouten 1981: 34). For the Rhine collection, intuition cases were more strongly associated with shorter distances, compared to dreams and hallucinations (Schouten 1982: 139); this association was not significant in the other collections, although a result in the same direction was observed in *Phantasms* (Schouten 1979: 445, Schouten 1981: 34, Schouten 1982: 142). Distance was not related to the sex of the percipient in any of the collections (Schouten 1979: 445, Schouten 1982: 139).

2.3.9. Cases in which the Experience was Related to the Percipient

For the Sannwald collection, Schouten compared cases with a target person to those where the experience was related to the percipient; the latter were largely precognition cases (Schouten 1981: 45). There were still more female percipients in self-target cases, but the difference between the number of male and female percipients was non-significant, and the distribution was significantly different to that of the other-target cases (Schouten 1981: 44-45). The forms of experience did not differ between these two sets of cases (Schouten 1981: 45). However, trivial cases were far more common, and serious events far less so, in cases where the experience was related to the percipient; such cases also contained significantly more details (Schouten 1981: 45). Clearly this can be explained by the relatively more common occurrence of trivial events than serious events in one's life; however, given that even in this set of cases 48.9% of events were serious, Schouten (1981: 45-46) proposed that this still indicated that serious events had a higher likelihood of becoming the subject of an ESP experience than trivial ones. No other meaningful differences between these sets of cases were found (Schouten 1981: 45).

For Rhine's self-target cases, the number of female percipients was still significantly higher than males, but to a lesser extent, and the distribution was significantly different to that of the other-target cases (Schouten 1982: 153). The distribution of forms of experience differed significantly from that of the other-target cases, but was very similar to the distribution for precognition cases that had a target; the difference thus appeared to be due to the type of ESP rather than the presence or absence of a target person (Schouten 1982: 153). In terms of event severity, self-target cases much

more rarely referred to deaths or serious accidents, and more frequently referred to slight accidents, trivial and positive events, than cases with another target person; material damage cases were still relatively low (Schouten 1982: 153). Self-target cases also contained significantly more details than other-target cases (Schouten 1982: 153).

2.3.10. Time Interval in Precognition Cases

One aspect of precognition that is not relevant for telepathic experiences is the time interval between the experience and the event. In 33% of cases this interval was less than 24 hours; in 67% of cases it was less than two weeks; in 95% of cases it was less than one year; and the remaining 5% of cases exceeded one year (Schouten 1982: 151). However, the distribution of intervals was significantly different between self-target and other-target cases; for cases relating to the percipient there were higher proportions of cases with intervals less than 24 hours and greater than one year (Schouten 1982: 154). For self-target cases there was also a significant association between form of experience and interval, where nearly all of the long-interval cases were dreams; this was not so for other-target cases (Schouten 1982: 154).

2.3.11. Lack of Retrocognition Cases

The work of Rhine and Schouten is marked by a lack of coverage of retrocognition. However, spontaneous cases of retrocognition are reported, albeit very rarely; Dobinson (1998) reports twelve such cases, identifying that they appear to be evoked either by the percipient's presence in a relevant environment, or by a specific related

object as in ‘psychometry’ (Dobinson 1998: 337). As mentioned earlier, the potential to explain apparently retrocognitive experiences through telepathy or clairvoyance (Dobinson 1998: 342) may be the reason for their lack of coverage in the studies discussed.

2.3.12. Schouten’s Overall Findings and Theory

Schouten’s extensive analyses allowed additional theorisation on the ESP process. For example, Schouten (1983: 330) argued that, despite a consistently greater number of female percipients, males and females do not seem to differ in ESP ability. Females’ experiences do not contain more details and do not cover larger distances (Schouten 1983: 330); in addition, in cases where no target person is involved, such as precognitive experiences relating to the self, the number of female and male percipients is much more balanced (Schouten 1983: 332). A reporting effect suggestive of more female contributors was only found in the Rhine collection (Schouten 1983: 330). These results appear to agree with the findings from experimental research that do not suggest any advantage for either sex (Schouten 1983: 330-331).

The very low proportions of cases involving purely material events, even in precognition cases relating to the percipient, seemed too low to Schouten (1983: 331) to be a reporting effect, and suggested to him that spontaneous ESP experiences are largely related to people and not material events. The target person is usually closely related to the percipient (Schouten 1983: 331), a serious threat to the target person usually seems to trigger the experience, and the target person is identified more often

than the event (Schouten 1983: 331-332). His findings suggested to Schouten (1983: 332) that the relationship between two people determines the probability of an ESP experience occurring, and also determines the target person and percipient; the probability of becoming the percipient is higher for the person who is more emotionally dependent on the other person (Schouten 1983: 332). One may expect that the death of a distant relative would be more likely to be detected than a slight accident or trivial event involving the same relative; however, seriousness of event does not seem to be related to the probability of detecting a case, suggesting that the nature of the relationship between the target person and percipient determines the occurrence of a paranormal experience, rather than any other effect (Schouten 1983: 331).

Schouten's findings also seemed to support Rhine's emphasis on the percipient as the active party, since no basic differences were found between the different types of ESP experiences (Schouten 1983: 334), i.e. telepathy, clairvoyance and precognition; the key differences appear more related to the experiential phase, such as the higher proportion of dreams in precognitive experiences (Schouten 1983: 334). Since other-target and self-target cases have similar characteristics, the target person would appear not to have a critical role in initiating experiences (Schouten 1983: 334). On a related point, in death cases there appears to be no systematic effect of moment of death on the moment of experience, suggesting that the experience is not triggered by either the target person's being alive or dead (Schouten 1983: 331).

Prior to Schouten's analyses, Stevenson (1970a) had criticised Rhine's suggestion of the lack of importance of the target person, based on his study of intuition cases

(Stevenson 1970b cited in Stevenson 1970a: 145) that showed percipients were more likely to take action when the target was thinking of the percipient at the time of the experience. Schouten examined this "focussing" of the target for the *Phantasms* collection, not finding any effects, before deeming it an overly difficult and unreliable task and subsequently abandoning it (Schouten 1983: 334). However, *Phantasms* contained all of the forms of experience, so it is possible that Stevenson's finding is valid for intuition cases only (Schouten 1983: 334-335). Alternatively, Schouten (1983: 335) proposed an analogy with visual perception; the percipient's role is more important in that they decide where to look, but the target person can also play a role by attracting their attention.

Rhine (1978: 23) interpreted the differences in dreams, intuitions and hallucinations as being due to psychological aspects rather than psi. Schouten (1983: 332) interpreted his findings as confirming this, but in a different manner. The only key, meaningful difference between the three collections he examined was regarding the form of the experience; as such, Schouten (1983: 332) considered this as the only variable that was culturally dependent. The fact that the properties of the cases were very similar, except for the form of conscious experience, suggested to Schouten (1983: 333) that the form of the experience must be unrelated to the process that generated the experience, thereby confirming the non-psi aspect of the experiential phase. Schouten (1983: 333) also considered the similarities between the cases as rejecting the cultural hypothesis, since the *Phantasms* cases were obtained in a time where the concept of telepathy was far less well-known than at the time of the Rhine collection.

Rhine (1978: 28) considered that the percipient acquires correct and complete psi information, but that errors and omissions occur during the experiential phase. For example, she proposed that conviction is not an objective element so cannot be transferred via imagery; as such, experiences involving high levels of imagery generally have lower levels of conviction than intuitions, despite the latter containing less information (Schouten 1983: 335). However, Schouten's interpretation was different, based on the fact that the number of details was related to identification of the event, but not the target person; the latter appears to be either known or not known (Schouten 1983: 335). However, the numbers of details are very low, even for dreams, and the more trivial events tend to have the most details; Schouten (1983: 335-336) thus suggested that the identification of both the target person and the event are basically of an all-or-nothing nature, implying that the content of the ESP experience involves only the most important aspects of the event.

Rhine (1978: 26) viewed conviction as an independent element of the experience that arises below the conscious level, not as the result of a conscious judgment in response to the experience. She suggested that, during the experiential stage, as the various elements (including conviction) transfer to consciousness, loss of information occurs, with the amount depending on the form of experience (Schouten 1983: 336). However, the "barriers" to transfer for the different forms appear to be inconsistent; intuitions have a high threshold for details but a low threshold for conviction, whilst the opposite is true for dreams (Schouten 1983: 336). Schouten (1983: 336) was unconvinced by this, pointing out that dreams can often be accompanied by very strong feelings and so would not be expected to have such a high threshold for conviction. He also observed that, while hallucinations and dreams both involve

imagery, hallucinations appear to have a higher threshold for details than dreams do (Schouten 1983: 336). However, for identification of the event and target person, all forms of experience appear to have similar thresholds (Schouten 1983: 336-337).

Based on his observations, Schouten proposed an opposing model to Rhine. He proposed that, following stage 1, only the most essential information is available to the percipient at an unconscious level, namely the target person and the event; this moves into consciousness with approximately the same amount of loss for each form of experience, with the same applying for the feeling of conviction (Schouten 1983: 337). This similarity between the forms of experience is supported by the similarity in characteristics between the different collections, despite their differences in distribution of the forms (Schouten 1983: 337). The form the experience takes will then involve different degrees of "creative activity" by the percipient; for example, creating a hallucination of a target person is a more complex process than simply 'knowing' who they are (Schouten 1983: 337). If minimal creative activity occurs, an intuition-like experience may be produced where the ESP information is accompanied by a feeling that it has an extrasensory source, and thus a strong feeling of conviction may be present; however, the more creative activity that occurs, the more non-ESP elements that will be added to the experience from fantasy and memory, and the lower the feeling of conviction will be (Schouten 1983: 337). In addition, this creative activity will produce a more realistic representation of the event than the original information, particularly if the percipient has knowledge of the target person's general situation at the time and is thus likely to create correct details (Schouten 1983: 337). Schouten (1983: 337-338) argued that his model is more parsimonious than that of Rhine, in that it does not have the problem of differing thresholds for different aspects

within a particular experience. Rhine and Tyrrell both recognised the creative activity of the percipient in producing the experience (Schouten 1983: 336), but Schouten (1983: 337-338) considered that his model more fully accounts for this aspect.

Schouten's ideas form intriguing opposition to Rhine, and are supported by extensive quantitative analyses of case features. Rhine's (1978: 28-29) suggestion that conviction is an independent element of the experience, rather than a reaction to it, is problematic; for example, the lack of conviction in dreams may simply be a consequence of learning that dreams are usually based on fantasy (Irwin & Watt 2007: 37), and Schouten's model does well to consider a similar aspect. However, it seems that Schouten's model struggles with its suggestion that the event is accessible without any details; it is questionable whether the ESP mediation process (stage 1), however it may function, is capable of categorising events in a similar manner to Schouten. One can conceive of a simple item of ESP information of the form "John is dead" that concisely identifies the target person and event without any details of the death; however, it seems intuitive that a short message containing details such as "John has broken his phone" would be more likely to occur than the more generic "John has suffered slight material damage". As such, although potentially an improvement on Rhine's ideas, this aspect of Schouten's model could be more convincing. Therefore, although these models proposed by Rhine and Schouten provide some plausible interpretations of how the ESP process may function, they both contain important flaws that render neither entirely favourable to the other.

Spontaneous cases have clearly allowed much theorisation on the experiential phase (stage 2) of ESP, but until knowledge of stage 1 is enhanced, along with an idea of

what information actually becomes initially available to the percipient, the theorised processes are necessarily somewhat speculative. Nevertheless, the next section covers a number of other theories that have attempted to explain stage 2. Theories of stage 1 are discussed in Chapter 6, alongside experimental research that has attempted to more specifically test aspects of those theories.

2.4. Other Theories of the Experiential Phase of Psi

The ideas previously mentioned regarding stage 2 of the ESP process, such as the importance of the unconscious, the creative activity of the percipient and the resemblance of ESP imagery to memory imagery, are key ideas that have been incorporated in several theories of other researchers. Memory models, such as that proposed by Roll (1966, 1987) suggest that the percipient does not directly receive information from the ESP stimulus (Edge *et al.* 1986: 191), but that long-term memory traces are activated, with the information in these traces forming the basis of the content of the experience; this activated information becomes apparent in consciousness through the same processes as 'ordinary' memories (Irwin & Watt 2007: 130).

Irwin's (1979 cited in Edge *et al.* 1986: 192) theory extended Roll's ideas and proposed that the evoked memory trace goes through processing similar to that of perceptual stimuli from external sources; this processing involves three stages, all occurring at the preconscious level. In the first stage, pattern recognition, the memory trace is compared to other traces to identify which of these it is most similar to. In the second stage, semantic coding, the memory trace is allocated a code, which may be

visual, verbal, or both. Finally, in the semantic analysis stage, the memory trace undergoes semantic analysis along with its code, allowing its meaning to be determined; only at this point does the ESP information become available in consciousness. The activated traces contain information that is *structurally* similar to the target stimulus, so, for example, a star shape may activate memories such as a flower or a wheel that have a comparable radial structure (Irwin & Watt 2007: 130). Similarly, Stevens (2002: 239) suggests that ESP is "imagination that relates to the target"; in the same way that external stimuli affect the content of dreams, so ESP information may affect and direct the content of imagination (Stevens 2002: 243).

Rhine (1978: 29) noted that psi experiences often fulfil some kind of need, and Stanford's (1974, 1990) psi-mediated instrumental response (PMIR) model also views psi as need-serving. The suggestion is that the individual uses psi to scan the environment for information that is relevant to a specific need; when such information is obtained, a disposition arises towards a psi-mediated instrumental response (Stanford 1990: 57). According to Stanford (1990: 102), "PMIR is accomplished through psi-mediated facilitation, release or triggering of behaviours, feelings, images, associations, desires, or memories that are already in the repertory of the organism and that can aid in the production of an instrumental response or that can be such a response". Furthermore, PMIR can occur without any awareness of the need that is being fulfilled or any idea that something extrasensory or extraordinary is happening (Stanford 1990: 94). In a more recent article, Stanford (2006: 123-125) provides an example in which he was driving late at night, accompanied by his wife, and had a sudden urge to deviate from his planned route for another. The alternative route would have provided the opportunity for the couple, who were avid birdwatchers, to see

ducks and geese, but Stanford realised this was somewhat inappropriate due to the darkness and the additional time it would take to complete the journey. Given his previous theorisation on the psi process, Stanford wondered if this urge was due to extrasensory information regarding danger on his original route, and decided to test this by slowly and cautiously proceeding on this route and ignoring his urge. Upon exiting the expressway they encountered a lamp pole that had recently been knocked down into the road by another vehicle; had they encountered this at normal speed an accident may have resulted.

Although not unequivocally an instance of psi, Stanford (2006: 125) considered this a potential illustration of how preconscious information, whether obtained via the senses or otherwise, may activate previously learned response dispositions. On previous occasions in daylight hours Stanford and his wife had made the same deviation to look for birds; he therefore considered that unconscious extrasensory knowledge of the fallen lamp pole on the planned route may have automatically activated an existing schema of the alternative route, with its accompanying attraction of the potential for birdwatching (Stanford 2006: 125). Had this urge to change routes occurred in daylight, the couple would likely have taken the alternative route and been unaware of the danger (Stanford 2006: 125); one may also assume that, had the same urge been present in a non-parapsychologist, they may have taken this route even in darkness, again likely unaware of the danger on the original route. Based on this model, the suggestion is that the forms of ESP experience identified by Rhine (1953a) are only those where the person becomes consciously aware of a potential psi component; Stanford (2006: 122) suggests that "contrary to popular assumption, conscious awareness of the [psi] information may be the exceptional case". Broughton

(2006) argued for the importance of the emotional system in selecting psi-mediated memories, but also drew upon research demonstrating the importance of this system in decision-making; both of these aspects are of relevance to the PMIR model (Broughton 2006: 27-28).

Stanford's PMIR model thus considers psi to be fundamentally need-serving; however, Rhine (1978: 29-30) considered there to be too many trivial experiences for this to be its only function, and thus suggested that it may serve a general purpose as part of the overall system by which people adjust to their environment. A more recent model containing a similar concept is Carpenter's (2004, 2005) model; Carpenter (2004: 218) proposes that "ESP is the leading edge of the mind's ability to move to the next experience", and that psi processes are continuously active but usually unconscious. As such, while Stanford (1974, 1990, 2006) argues that psi is active more often than appreciated, Carpenter (2004: 242) argues that psi is the initiating point of all human experience, hence this model is termed the *First Sight* model (Carpenter 2004: 218). Carpenter (2004: 220) proposes that organisms can access events beyond their physical boundaries, and that objects or events that are the most relevant to the organism will be selected, with ESP effectively having the function of orienting the organism towards or away from specific items (Carpenter 2004: 222). Similarly to the previously mentioned models and theories, memory and imagination are important parts of the First Sight model. Carpenter (2006: 44) suggests that the mind draws upon all available sources of information when developing experience, including psi, memories, subliminal stimuli and imagination; indeed, a number of findings in memory-ESP research fit with this model (Carpenter 2006: 43).

Thus, although there are some differences, it would appear that several theorists agree on the apparent involvement of memory in the experiential phase (stage 2) of psi. However, the mediation aspect (stage 1), i.e. how the individual actually accesses the extrasensory information, is still very unclear (Irwin & Watt 2007: 130); this issue will be discussed in more depth in Chapter 6. Other theories have also been proposed to explain stage 2; Irwin and Watt (2007: 129) distinguish between the aforementioned memory models and what may be termed pseudosensory models, in which ESP is considered to operate in a sensory-like manner. For example, Schmeidler (1991) proposed that processing of psi inputs is very similar to sensory inputs, in terms of the discrimination of a figure from its background; thus the stronger the psi 'signal' the more processing it will receive. However, Irwin and Watt (2007: 130) argue that this model is not well-supported; experimental research does not show any effect of sensory discriminability of the ESP target (in terms of size, orientation, contrast etc.) on ESP performance.

Overall, memory models would therefore seem to be more satisfactory than pseudosensory models. However, as discussed earlier with relation to Rhine's (1978: 26) theorisation, the suggestion that ESP experiences involve memories and imagination raises important questions as to whether ESP is indeed involved, or whether these experiences are in fact entirely created by the individual. Therefore, these memory models are also not wholly satisfactory in terms of providing a theory of ESP experiences that convincingly rules out non-ESP explanations; the latter will now be discussed in more depth.

2.5. Non-ESP Explanations for ESP Experiences

The discussion so far has largely focussed on case features and theories to explain these features in an ESP context. Other research has been conducted using survey techniques, to examine the prevalence of ESP experiences in the population and to identify any consistent characteristics of individuals who claim to have such experiences. One such study was conducted by Palmer (1979) who obtained results from 354 residents of Charlottesville and 268 students from the University of Virginia. Fifty-one percent of the residents and 55% of the students reported at least one ESP experience (Palmer 1979: 248). Predictors of psi and psi-related experiences included dream recall, lucid dreaming, analysis of dreams (residents only), visits to psychics (residents only), a positive attitude towards the importance of parapsychological research, belief in reincarnation, belief in astrology, and being separated or divorced (Palmer 1979: 248-250). A number of variables were not good predictors of psi experiences, including sex, race, birth order, drug use, meditation, opinions about the survival of death, and religiosity (Palmer 1979: 249). A more recent survey, using 648 Argentinean students and 220 Peruvian students, found that 45% of the Argentineans, and 43% of the Peruvians, reported at least one ESP experience (Parra & Paul 2010: 150). Experients scored more highly than non-experients on overall schizotypy, the cognitive-perceptual dimension of schizotypy, absorption, and fantasy proneness (Parra & Paul 2010: 151-152).

It is clear, then, that ESP experiences are widely reported, but some of the correlates with such experiences are noteworthy. For example, one may consider belief in astrology as illustrating a level of gullibility, due to the lack of evidence of its

effectiveness (e.g. Carlson 1985), and a tendency to be fantasy prone may also cast doubt on the reality of reported experiences. Indeed, case reports rely entirely on truthful testimony from percipients, target persons and other witnesses, and even the most honest of respondents may unwittingly provide erroneous statements due to a variety of factors. Prior to Rhine's series of articles in the 1950s and 1960s, West (1948b) identified a number of issues with reports of spontaneous cases, such as the possibility of unintentional exaggeration and the possibility of chance coincidence, particularly regarding apparently precognitive dreams where many dreams may be forgotten and only those that are seemingly veridical are remembered (West 1948b: 265-266); West (1948b: 280-281) demonstrated evidence that this was indeed the case for hallucinatory experiences, where non-veridical cases were more quickly forgotten than veridical cases. This possibility of chance coincidence would seem especially likely to be the case if the dream is not in an exceptional form, but even the report of an exceptional aspect, or a claim of conviction of the reality of the impression, relies on the percipient's memory and truthfulness (West 1948b: 267-268). Déjà vu, which does not appear to be a paranormal phenomenon (Brown 2004: 116), may be also be an explanation for a feeling of having already seen or dreamed of an event (West 1948b: 267). West (1948b: 268) found thirty-two cases where percipients had sent their apparently precognitive impressions (not all dreams) to the SPR before the event had occurred, but in none of these instances had the prediction come true, lending support to the suggestion that apparently veridical precognitions are so rare as to be statistically non-significant. Experiments involving individuals recording all of their dreams to discover how many came true were also either unsuccessful or unconvincing (West 1948b: 268-269). West (1948b: 269) considered that only experiences containing a large number of correct and unlikely details would provide a

strong case against coincidence, but he also argued that these are very rare, and that even the best cases have flaws in the circumstances of the experience or the supporting evidence (West 1948b: 271).

The issue of coincidence is of particular interest, given the relative incompleteness of many of the experiences. The parapsychological theories discussed earlier would consider this incompleteness as either due to the percipient receiving an incomplete ESP 'message', the operation of a threshold that means some material does not transfer to consciousness, or the inability of the activated memories to produce a realistic and complete image of the event. However, this may alternatively reflect what Marks (2000: 41) refers to as 'subjective validation'; he defines this as occurring "when two, unrelated events are perceived to be related because a belief, expectancy, or hypothesis demands or requires a relationship". Rhine (1962b: 175) noted that, for realistic dreams, experiences that did not identify the person or people involved usually identified the event, and vice versa. This could be interpreted as indicative of subjective validation; a dream about a particular individual could easily be matched to any notable event that involves that individual, and a dream about a noteworthy event could easily be matched to any known individual that is involved in such an event. As such, much of the speculation and theorisation about the incomplete nature of ESP experiences may be misplaced. However, with complete, detailed experiences the subjective validation hypothesis carries less weight.

A number of other considerations must be made with precognitive cases. A person may have legitimate concerns or worries, which are experienced in a dream, prior to their worries being borne out by the event (West 1948b: 272). In cases such as those

involving apparently sudden serious illness or death, the percipient may have unconsciously noticed signs of ill-health in the target person before they were represented in a dream (West 1948b: 272). Furthermore, if a person is told about a precognitive experience involving them, they may subconsciously act to bring about the predicted event (West 1948b: 272). Individuals often worry about those to whom they are emotionally close, and may then attach special meaning to instances where their worries are validated; this would explain the predominance of cases between close relatives and the prevalence of negative events (Schouten 1979: 450-451). Although worries may often be validated, people may attach special meaning to instances in which the worries are experienced in a striking manner or where there is no rational reason to be worried (Schouten 1979: 451).

Hoaxing and fraud are also possibilities with any unsubstantiated accounts, or even in substantiated accounts if witnesses are colluding; motives may include the pleasure of deception, or the desire to make the scientific world pay more attention to experiences of this kind (West 1948b: 275). However, it would seem that relatively few accounts are pure lies (West 1948b: 274-277), and Schouten (1979: 451) considered it very unlikely that the observed patterns and relationships would be found if large numbers of contributors were independently fabricating their accounts.

West (1948b: 279) also considered the issue of errors of memory, for example due to the tendency for a percipient to give more detail on, or exaggerate, points that favour a paranormal interpretation while forgetting aspects that fit with a more normal explanation. West's (1948b: 280-281) examination of hallucinatory cases not only

demonstrated that non-veridical cases were quickly forgotten, but that the remembered cases gained apparently coincidental features that were actually false.

Hallucinatory cases are perhaps striking due to the apparent rarity of hallucinations in the general population; moreover, in death cases such a rare experience occurs at the same time as another rare occurrence in the percipient's lifetime (West 1948b: 282). However, West's (1948a: 191) survey of hallucinations suggested that 14.3% of the population had experienced one or more hallucinations; more recent work by the same author obtained figures of 14.6% (West 1990: 167) and 22.0% (West 1995: 168), suggesting that, although reported by a minority, they are not as rare as perhaps supposed. West (1948b: 282-283) also argued that the probability of impending death may vary with the circumstances, and if the percipient expects a death is likely this may generate a hallucinatory experience through suggestion, with the content determined similarly to dream content. A similar process was proposed by Dobinson (1998: 341) for retrocognitive experiences, which may explain why such experiences are apparently triggered by being in a specific environment, or touching a specific object, that is relevant to the experience. Alternatively, for some hallucinatory cases, particularly those occurring in public places, mistaken identity may play a role; the apparent hallucination may be a real person who strongly resembles the presumed target person (West 1948b: 277).

In spite of the industry of the early SPR members to authenticate cases, West (1948b: 290) was generally critical of the quality of the cases collected, in terms of their veridical content and the corroborative evidence accompanying them. He estimated that for every "good" case there were a hundred that could easily be explained by

normal means (West 1948b: 299). He also suggested that, whilst the good cases strongly pointed to a paranormal interpretation, there was a possibility that they were simply due to "an unusual extension of the normal factors" that were known to be more plausible explanations for the many poorer cases (West 1948b: 299).

Despite the age of West's (1948b) article, all of the issues raised remain valid. More recently, French and Wilson (2006) reviewed a body of research examining ways in which errors of memory may lead to inaccurate reports of anomalous experiences and events. For example, if the experience occurs in darkness or semi-darkness, if the person is in an altered state of consciousness such as falling asleep, and if the experience is unexpected or ambiguous, this may undermine the reliability of the account (French & Wilson 2006: 167-168). Paranormal belief can affect memory of an apparently anomalous experience, while verbal suggestions occurring during the experience, misinformation following the experience and discussion with fellow witnesses can also lead to the creation of false memories (French & Wilson 2006: 168-172). The susceptibility to false memories appears to correlate with fantasy proneness, hypnotic suggestibility, dissociativity, absorption and vividness of visual imagery, which are all variables that have been demonstrated to correlate with paranormal belief or a tendency to report paranormal experiences (French & Wilson 2006: 172-173). Evidence has also been obtained that paranormal believers are more likely to report false memories even in non-paranormal contexts (French & Wilson 2006: 174-175). Thus, reports of paranormal experiences may be somewhat prone to containing false memories.

Overall, it is clear that there are numerous potential non-paranormal explanations for ostensible ESP experiences, covering why a coincidence between an experience and an event may occur, why it may be interpreted as meaningful, and why memories of the experience may become distorted and thus enhance the apparent paranormality of the percipient's account; many of these explanations are also supported by research evidence (French & Wilson 2006). These would therefore appear to be entirely plausible explanations for many cases that percipients may interpret as ESP, particularly those involving "vague coincidences or distant recollections", which West (1948b: 299) considered as outnumbering the "good" cases by approximately a hundred to one. Nevertheless, the good cases remain to be explained. West's (1948b: 299) suggestion, that good cases may be explained by "an unusual extension of the normal factors" involved in weaker cases, is valid; however, it is also likely that, even if ESP exists, there will inevitably be many non-ESP cases that are mistakenly interpreted as ESP. The most exceptional cases, involving vivid, detailed experiences that correspond strongly with unexpected events, still provide a sufficient enough challenge to non-ESP explanations to render these cases worthy of further consideration.

2.6. The Aftermath of ESP Experiences

Some of the previously mentioned findings provide theoretical suggestions relating to how, following ostensible ESP experiences, errors of memory and other psychological processes may affect percipients' accounts. Irwin and Wilson (2013: 66) distinguished between two important aspects of having a parapsychological experience, namely the experience itself and the subsequent attribution to a paranormal cause. The interval

between these two points, and the interval before the experience is later reported, will undoubtedly vary in different cases, during which time there is potential for thoughts, feelings and memories to change. For example, Green (1960: 100) noted the tendency for some respondents to engage in "elaborate theorizing", which she considered may have led them to unconsciously change the emphasis in their accounts to fit with their own theories.

Milton (1992: 314) considered that the aftermath of paranormal experiences had been inadequately investigated. She argued that, as with the various features of the experience and event, the post-experience thoughts, feelings and actions of percipients can aid theorisation (Milton 1992: 314). The percipient's assumptions about the paranormal and about the causes for their experience can also lead them to omit potentially useful information if they deem it irrelevant, or alternatively they may be better placed than the researcher to form a theory about what has happened due to their knowledge about the situation (Milton 1992: 315). In addition, knowledge about how experients deal with their experiences can provide suggestions on how to help others cope with what can be a major life event (Milton 1992: 315).

Milton subsequently obtained experience reports from twenty-two people, restricting the survey to experiences that had happened at least five years previously in order that any long-term effects would be apparent (Milton 1992: 315). In addition to questions about the experience and event, the questionnaire also contained items regarding the apparent cause or purpose of the event, other individuals who the percipient told about their experience, how they reacted and how this affected the percipient, and short-term and long-term effects of the experience (Milton 1992: 322-323). In order to gain

detailed responses from interested respondents, Milton's participants were largely from the SPR and Scottish SPR; she conceded that they would likely not be typical of the general population, but also considered that they would be expected to have coped relatively well with their experiences and could therefore provide suggestions as to how this coping was achieved (Milton 1992: 315).

Reports of twenty-three experiences were obtained, although there were only seven of apparent ESP (three GESP and four precognition), with the others relating to apparitions of the dead, out-of-body experiences (OBEs) and other experiences that did not fit into specific categories (Milton 1992: 316). Due to the low numbers, Milton (1992: 316) did not compare categories, so the relevance of some responses to ESP experiences specifically is questionable; nevertheless a number of intriguing findings were obtained.

Suggested causes of the experiences included the percipient's mundane needs, their need for spiritual growth, and their recent experience of a novel state of consciousness (Milton 1992: 317). Immediate emotional reactions to the experience predictably included surprise and puzzlement, but a number also included fear, with two experients feeling joy or elation (Milton 1992: 317). In terms of telling people about their experience, responses ranged from telling no-one through fear of ridicule, to immediately hurrying to tell people; reactions to being told ranged from denial of the reality of the experience to a positive response (Milton 1992: 318-319). Selecting people to tell who would not react negatively was a common choice; indeed, some experients reported relationships suffering following a negative reaction (Milton 1992: 319).

In the long term, most experients had a positive attitude towards their experience, even if they had reacted fearfully at the time (Milton 1992: 319). Some felt that the experience had little effect upon their life, whilst others were much more strongly affected, in terms of their views and beliefs as well as their life choices (Milton 1992: 319-320). All types of experience seemed capable of enhancing belief in the paranormal or a spiritual or philosophical outlook, and some respondents also had enhanced belief in life after death; the latter was not exclusive to apparent encounters with deceased entities (Milton 1992: 320). Milton (1992: 320-321) considered the most striking effect as being a feeling of excitement at the challenging of the percipient's world-view and their compulsion to discover what may have happened to cause their experience.

Milton's study has thus provided some fascinating findings relating to ostensibly paranormal experiences, but the work is hindered by a small and non-typical sample; the inclusion of a range of different types of experience also prevents a more in-depth examination of any specific type. There is clearly much to be gained from performing a similar study with a larger sample size and examining a specific type of experience such as ESP.

2.7. Justification for Further Study of Spontaneous Cases of ESP

This chapter has covered in some detail the collection of spontaneous cases of ESP, particularly by Louisa Rhine, and the extensive quantitative reanalyses of three case collections, including that of Rhine, by Schouten. Rhine's (1953a) collection enabled her to categorise the experiences into four broad forms, while Schouten's (1979, 1981,

1982, 1983) analyses demonstrated a number of common patterns across the collections. Although these researchers were aware of the weak evidential value of spontaneous cases, both used their findings to propose theories relating to the ostensible second stage of the ESP process, where the paranormally-acquired psi information moves into consciousness via ordinary psychological mechanisms, following the original ideas of Tyrrell (1946). Rhine (1953a: 107) noted that imagery in dream ESP experiences seemed very similar to that of memory, and suggested that psi information may be "contaminated" by memories and desires (Rhine 1978: 26), while Schouten (1983: 337) argued that the form of experience depends on different levels of "creative activity" by the percipient. Several other researchers have also proposed theories relying on the role of memory or imagination in the creation of the conscious aspect of the ESP experience (e.g. Carpenter 2004, 2005, 2006, Irwin 1979 cited in Edge *et al.* 1986: 192, Roll 1966, 1987, Stanford 1974, 1990, 2006, Stevens 2002).

There is therefore some agreement among researchers as to the role played by memory, desires and imagination in ESP experiences, but this raises important questions as to whether ESP is in fact involved at all; it is conceivable that the experiences are entirely formulated from these processes and are then interpreted as meaningful due to their apparent similarity to a coincidental event, with subsequent errors of memory enhancing the apparent impressiveness of the correspondence. This suggestion is supported by findings demonstrating that experients score more highly than non-experients on measures of fantasy proneness (Parra & Paul 2010: 152), veridical cases are remembered whilst non-veridical cases are quickly forgotten (West 1948b: 280-281), and individuals who score highly on measures of fantasy proneness

or paranormal belief are more susceptible to false memories (French & Wilson: 172-175). Furthermore, West (1948b: 290) was generally critical even of the well-authenticated accounts published by the early members of the SPR, and estimated that good cases outnumbered poor cases by approximately a hundred to one (West 1948b: 299).

One may therefore reasonably argue that spontaneous cases suggest the ESP hypothesis is rather weak, given the numerous potential non-ESP explanations for many of the reported experiences. However, the continued study of these experiences is justified for several reasons. Surveys suggest that ESP-type experiences are reported by approximately 40-50% of respondents (Palmer 1979: 258, Parra & Paul 2010: 150), so these are clearly very common experiences that deserve scientific attention to ensure they are fully understood. Although good cases are rare, this fact in itself does not preclude the existence of ESP; West (1948b: 299) considered that these cases strongly suggested a paranormal explanation, despite his generally negative view of the remainder (West 1948b: 290). One may also argue that experimental findings demonstrating apparent evidence for ESP, such as those from ganzfeld research (see Palmer 2003), indicate that ESP is a genuine phenomenon and therefore may be in operation in at least some spontaneous cases. However, West's (1948b: 299) suggestion, that good cases may be explained by "an unusual extension" of the non-ESP factors involved in weaker cases, is entirely plausible, and this is also worthy of further investigation. In particular, there has been little research into the aftermath of ESP experiences, despite the tendency for percipients to engage in their own theorisation and for this to potentially alter their accounts (Green 1960: 100); if this

tendency can be detected even in the best cases, it will render the ESP hypothesis weaker still.

In Chapter 1, it was stated that the aim of this thesis is to attain a full appreciation of the factors involved in ostensibly extrasensory experiences, and to examine whether these factors are parapsychological or purely psychological. Although much knowledge has been obtained regarding spontaneous ESP experiences, it is apparent that much is still to be learned, particularly regarding how percipients respond to their experience and how this may affect their subsequent account of it. The distinction between the experience and the attribution of its cause is an important one, and there is much scope for an in-depth analysis of how and why percipients make these attributions. At the same time, given the age of many of the case collections in the parapsychological database, there is a need for additional contemporary cases to be collected to examine whether similar patterns in the cases are found. It is clear, then, that further study of spontaneous cases of ostensible ESP is required in order to gain a fuller understanding of the factors involved in these experiences. The subsequent chapter details a study that covers all of these aspects.

Chapter 3

Spontaneous Cases of Ostensible ESP:

A Self-Report Study

3.1. Introduction

The previous chapter discussed the collection of spontaneous cases of ESP, particularly by Louisa Rhine, and covered in detail the extensive quantitative reanalyses of Rhine's cases, *Phantasms of the Living*, and the Sannwald collection, by Schouten (1979, 1981, 1982, 1983). It is clear that Rhine's (1953a) early categorisation of the four forms of experience (intuitions, hallucinations, realistic dreams and unrealistic dreams) has remained intact, despite the terms (particularly 'intuitions') not being totally adequate in defining the groups (Rhine 1953a: 81). Schouten's (1979, 1981, 1982, 1983) analyses also demonstrated a number of common patterns across the case collections, such as the predominance of female percipients and male target persons, the predominance of close relationships between the percipient and target person, the predominance of negative events, the tendency for the target person to be identified more often than the event, and the tendency for conviction to be highest in intuitions and lowest in dreams. The only major difference between the collections was in terms of the frequency of the forms; for *Phantasms*, hallucinations were most common, whereas dreams were most prevalent for the other collections (Schouten 1979: 427, Schouten 1981: 25, Schouten 1982: 130). Schouten (1982: 140) considered this discrepancy as due to cultural differences between the

collections, but also due to the use of the word ‘apparitions’ by the *Phantasms* investigators when soliciting cases.

Although aware that spontaneous cases cannot provide evidence for the existence of ESP, Rhine (1953a, 1956, 1978) and Schouten (1983) used their findings to propose theories of the ostensible second stage of the ESP process, where the psi information moves into consciousness using psychological, rather than parapsychological, mechanisms. For example, Rhine (1978: 25) suggested that the information available following ‘transmission’ via ESP (stage 1) was essentially complete and correct, but that errors arose during the second stage, with the types of errors relating to the form of the experience (Rhine 1978: 28). In contrast, Schouten (1983: 337) argued that only the essential information, namely the target person and event, was available following stage 1, and suggested that the form of experience depended on the level of “creative activity” by the percipient.

This theorisation relies on the reported spontaneous cases being genuine instances of ESP (or at least a sufficient majority for the overall patterns to be valid). However, a number of non-paranormal mechanisms may be in operation, including unintentional exaggeration, chance coincidence (West 1948b: 265-266), subjective validation (Marks 2000: 41), legitimate concerns or worries being borne out (West 1948b: 272) and errors of memory (French & Wilson 2006, West 1948b: 279). Despite the careful authentication by the early SPR members, West (1948b: 290) was largely critical of the quality of the collected cases, arguing that the vast majority could easily be explained by normal means (West 1948b: 299). This is clearly a concern; West’s

suggestion implies that the foundations for the existence of the field of parapsychological study may be extremely unstable.

West's remarks were made some 65 years ago, yet they did not seem to have any major effects; Rhine continued with her collection of unauthenticated cases, as did others such as Sannwald. Analysis of the features of spontaneous cases has been valuable in terms of their ability to provide suggestions for experiments, as argued by J. B. Rhine (1948b: 232-233); for example, knowledge of the number of experiences occurring during dreams led to the conducting of dream ESP studies (e.g. Ullman *et al*. 1973). However, Louisa Rhine (1970: 150) acknowledged that she moved on to see spontaneous cases as demonstrating fundamental concepts of the psi process; this may have been unwise given West's reservations. Similarly, Schouten (1983: 325-327) claimed to approach his analyses considering ESP as a hypothesis rather than a proven phenomenon, thereby taking the "pragmatic" rather than the "metaphysical" approach. He performed a number of interesting analyses examining the possibility of various biases and reporting effects in the data, but also engaged in considerable theorisation as to the ESP process based on consistencies in case features.

There is therefore a need for a more critical examination of spontaneous case reports, that attempts to take into account the various non-paranormal mechanisms that may be operating. It may be that so few cases stand up to scrutiny that ESP no longer seems a viable hypothesis for any of the cases. However, such an analysis does not inevitably weaken the pro-psi position; it may be that the argument for ESP is stronger in some types of experience than others. The theorisation of Rhine and Schouten appeared to treat all cases as ESP as long as they seemed to have an ESP

component, which may not be a valid assumption; the potential ability to focus on a more specific subset of cases as being more likely to involve ESP, and to use this information in laboratory studies, may be a positive outcome.

Irwin and Wilson (2013: 66) distinguished between two aspects of having a parapsychological experience, namely the experience itself and the subsequent attribution to a paranormal cause; the second aspect is of most interest here, including the thought processes of the percipient in the immediate aftermath of the experience, in addition to how these have been affected by the processes of time and discussion with other individuals. Milton (1992) conducted a study in which she questioned 22 participants about their experience, including questions regarding the perceived cause or purpose of the event, who the participant spoke to about their experience, how they reacted and how this subsequently affected the participant (Milton 1992: 322-323). Some interesting findings were obtained; for example, some percipents reported telling no-one about their experience due to fear of ridicule, while others chose a confidant who would not react negatively (Milton 1992: 318-319). Most experients also reported a positive attitude towards their experience in the long term, even if they had reacted fearfully at the time, and many also reported increased belief in the paranormal or an enhanced spiritual or philosophical outlook (Milton 1992: 320). However, the study had a small sample size, obtained participants largely from the SPR and Scottish SPR, and only produced seven experiences of ostensible ESP.

The present study thus aimed to replicate Milton's study with a larger, more representative sample, and focus entirely on ESP experiences. Rhine (1951: 165-166) accepted cases as long as they "seemed to be contributed in good faith and by

apparently sane individuals", and had some apparent psi aspect; the key criterion for this collection was similar but slightly more inclusive, in that the participant had to have had an ESP-like experience, but was not required to believe that their experience was truly extrasensory. This allowed the inclusion of some cases that were relatively weak evidentially, but these were included since the study's focus was more concerned with understanding participants' interpretations of their experiences. The reliability and validity of newly collected cases can be expected to be satisfactory; past research has suggested that hoax cases are rare (Schouten 1979: 451, West 1948b: 274-277), and non-authenticated cases have been found to be little different from those that have undergone extensive corroboration (Schouten 1979: 448).

Participants were first asked to describe their experience in as much detail as possible, but were also asked a series of questions about their attributions and about their thoughts, feelings and actions in the aftermath of their experience. This allowed an examination of the characteristics of the cases in the same manner as Schouten (1979, 1981, 1982, 1983), in addition to a more thorough examination of whether there was any potential for issues such as coincidence, subjective validation etc. to have been responsible for the apparently paranormal nature of the experience. This questioning of why the experients interpreted these experiences as having a paranormal or anomalous character fulfils Schouten's (1983: 327) definition of the "pragmatic approach".

Based on the most consistent findings from the analyses of Schouten (1979, 1981, 1982, 1983), a number of hypotheses were made regarding features of the cases:

1. There would be more female than male percipients.
2. In cases that did not involve another individual as a target person, the bias towards female percipients would be less pronounced.
3. There would be more male than female target persons.
4. Close family relationships would be most prevalent, followed by acquaintances, other family members, and strangers.
5. Dreams would be the most prevalent of the forms of experience, followed by intuitions and hallucinations.
6. There would be a predominance of negative events.
7. In cases that did not involve another individual as a target person, trivial cases would be more common, and serious events less common, than in cases where the experience was related to another person.
8. The target person would be identified more often than the event.
9. Dreams would be most associated with identification of the event, while hallucinations would be most associated with identification of the target person.
10. Intuition cases would show the most conviction, whilst dreams would show the least.

3.2. Method

3.2.1. Design

An opportunistic correlational survey design was used, examining associations between the following variables: Sex of percipient; sex of target person; presence/absence of target person; occupation; relationship between percipient and

target person; type of ESP; form of experience; type of event; identification of target person; identification of event; and conviction.

3.2.2. Participants

Ethical approval was obtained from the Coventry University Ethics Committee (see Appendix A) before the study began and before any potential participants were contacted. Participants were an opportunity sample of volunteers. A press release (see Appendix B) was distributed, which led to advertisements in several local newspapers and on several websites; the researcher also appeared on a local radio show to promote the study. Students of Coventry University were also invited to participate as part of the University's research participation scheme (see Appendix C). The press release and the student advertisement defined ESP and provided a brief description of the types of experience that were requested; they also made clear that participants were not required to believe that their experience was of a paranormal or extrasensory origin.

There were 144 responses to the questionnaire; unfortunately a substantial number of these needed to be removed as the answers were either facetious, partly or mostly missing, or referred to paranormal experiences of a non-ESP type. In addition, several participants attempted to report multiple experiences in a rather general manner, which rendered it difficult to relate responses to specific experiences. Following removal of unusable submissions, 94 participants with valid responses remained, of which 15 were male and 79 were female. Ninety-three participants provided their age; ages ranged from 18 to 69 years (mean = 24.1, SD = 9.49). Sixty-three were students,

28 were employed, 1 was unemployed and 2 were retired. Seventy-five were white, 9 were asian, 7 were black, and 3 were of mixed ethnicity; these figures are very similar to those from the 2011 Census of England and Wales (Office for National Statistics 2012: 3), suggesting a representative cross-section of the population was obtained in this respect. Forty-nine participants were in a relationship but not married, 10 were married, 38 were single, and 1 was divorced. Six participants had an undergraduate degree, 80 had achieved A-Level qualifications or equivalent, 4 had completed GCSEs or O-Levels, and 1 reported leaving school with no qualifications (3 participants did not respond to this question).

3.2.3. Materials

A paper-based questionnaire was created (see Appendix D), and an identical online version was hosted on the SurveyShare website (http://www.surveyshare.com) to allow online responses. However, no respondents requested the paper-based version; all responses occurred online. The questionnaire requested a series of demographic details including sex, age, ethnicity, marital status, occupation and education. Participants were then asked to describe their experience in as much detail as they could, with follow-up questions to request specific details if they were not included in this description; these included details regarding time (e.g. how long ago the experience occurred), where the person was, what they were doing, and whether other people were involved in the experience. Questions were also included regarding the effects of the experience, and its confirmation as corresponding with a real-life event, on the participant's thoughts and feelings in the short and long term. Participants were asked who they told about the experience, why they chose this person or these people,

when this was, how the person/people reacted and how this affected the participant; if they had not told anyone, they were asked the reason for this. Questions were then included regarding whether the participant had considered a non-paranormal explanation, and why they had concluded that the experience had a paranormal cause, if they had done so. All questions allowed participants to respond with full text responses, to enable them to describe all aspects in their own words rather than restricting them to predefined categories.

3.2.4. Procedure

Participants who responded to the advertisement by visiting the appropriate URL were able to give their informed consent to participate, and were free to withdraw from the study at any time. Participants could complete the questionnaire at their own pace, with an option to save their progress and return at a later time. Upon completion of the questionnaire participants were thanked for their time and presented with debriefing information.

Due to the free text response format of the questions, participants were able to provide multiple elements in a single question response; for example, many reported multiple thoughts and feelings in reaction to their experience and its confirmation. Each element in each participant response was first identified, and categories were then created by grouping qualitatively similar elements together. This procedure was performed so as to create meaningful, inclusive categories whilst still allowing for separation of similar concepts that had subtle, yet important differences. For example, in terms of short-term reactions to the experience, responses such as forgetting it had

occurred, or remembering it but thinking nothing of it, both appeared similar enough to be included in a 'disregarded' category. However, despite superficial similarity, responses such as shock and surprise were categorised separately due to the latter's milder connotations.

3.3. Results and Discussion

Note: Some of the figures reported below may change slightly in different analyses, for several reasons; for example, some participants provided incomplete or unclear responses for some questions. Four of the experiences referred to pets as the target 'person'; these are excluded from analyses involving the sex of the target person. In addition, three experiences occurred with a target person where the identity of that person was obvious from the percipient's situation; these are excluded from analyses relating to the target person. Note also that where cases are described as having a target person, this does not include cases where the target was the percipient.

3.3.1. The Percipient

There were 79 female (84.0%) and 15 male (16.0%) percipients; this difference was significant: χ^2 (1, N = 94) = 43.57, p < .001, w = .681. Thus, the female predominance from the earlier collections was replicated here, supporting hypothesis 1. Approximately two-thirds of participants were psychology students (a strongly female-biased population), thus there was a strong possibility of a reporting effect; however, removing all students from the analysis produced a slightly stronger female bias (87.1%) in the remaining 31 participants, demonstrating that the student

participants were not the cause of this bias. These figures are very similar to the 83.3% proportion of females in the Rhine collection (Schouten 1982: 121). The high proportion of females as percipients thus appears to be a highly consistent finding.

Experiences with a target person had 62 female (89.9%) and 7 male (10.1%) percipients, while experiences without a target person had 15 female percipients (68.2%) and 7 male percipients (31.8%). A chi-square test of these data demonstrated that the experiences without a target person were significantly less female-biased than those with a target person: χ^2 (1, N = 91) = 6.02, p = .014, Φ = .257. This supports hypothesis 2 and Schouten's findings from the Sannwald and Rhine collections (Schouten 1981: 44-45, Schouten 1982: 153). This finding of a more balanced sex ratio in experiences without a target person supports Schouten's (1983: 332) suggestion that the sex of the percipient by itself may not be an especially strong determinant of the probability of an ESP experience occurring; instead, the stronger female bias in experiences that do have a target person may reflect that the relationship between the percipient and the target person is more important in determining the probability of such an occurrence.

3.3.2. The Target Person

There was a slight female bias in the sex of the target person, with 26 (50.8%) female, 31 (42.6%) male, and 4 (6.6%) including a pair of target persons of both sexes. Considering only the cases with a single target person, the difference in sexes is not significant: χ^2 (1, N = 57) = 0.439, p = .508, w = .088. This does not support hypothesis 3, and contradicts the very consistent findings of a male bias in previous

collections (Schouten 1979: 417, Schouten 1981: 30, Schouten 1982: 124). Schouten (1979: 426) suggested that the male-dominated society of the Victorian era led to the higher proportion of male target persons in the *Phantasms* collection, due to the higher emotional dependence on males; this may also have been operating to some extent in the Sannwald and Rhine cases, collected as they were in the 1940s, 1950s and 1960s. It is thus plausible that the more equal society of the current era has led to more equal emotional dependence on the two sexes.

3.3.3. The Relationship Between the Percipient and the Target Person

In experiences with a target person, close family relationships (spouses, parent/child pairs and siblings) were the second most common, reported by 17 participants (25.4%), behind other family relationships, reported by 23 participants (34.3%). These categories were followed by friends and acquaintances (16 participants; 23.8%), strangers (7 participants; 10.4%) and pets (4 participants; 6.0%). Due to the high proportion of other family relationships, this distribution does not support hypothesis 4 and does not follow the consistent findings in previous collections, where this form of relationship was the third most prevalent behind close family and friends/acquaintances (Schouten 1979: 420, Schouten 1981: 22, Schouten 1982: 126). This group of cases mainly involved grandparents (11 cases), cousins (3 cases) and aunts and uncles (2 cases). Schouten's categorisation, used here, does not distinguish between closeness of relation and closeness of emotional bond; for example, one participant described his great uncle as "like a father figure", yet this relationship was in the other family category. The high proportion of young adult participants may also have led to an increase in the number of cases involving grandparents, as these will

likely have been their most salient experiences (8 of the 11 cases involved death). Overall, despite the difference between this collection and those examined by Schouten (1979, 1981, 1982, 1983), it is still clear that a majority of cases involve target persons who are close to the percipient, either biologically or emotionally.

3.3.4. Type of ESP

Categorisation of the ostensible type of ESP involved in the experience presented some difficulty. For example, several participants reported dreaming of receiving examination grades; it is difficult to determine whether this would represent clairvoyance of the marked scripts, telepathy from the markers, or precognition of the event of receiving the grades. The category assigned was that with the highest face validity; for example, these experiences all made reference to the reception of the grades, and thus were categorised as precognition. Similarly, retrocognition was assigned where the experience appeared to relate to the existence of a person or location in the past. For an experience that seemed to occur simultaneously with an event, the distinction between telepathy and clairvoyance was often difficult to determine with certainty. It was thus decided, using Schouten's (1982: 120) suggestion, to classify all of these cases as GESP; however, based on the fact that all but one of these cases had a target person, this category is perhaps likely to be more representative of telepathic experiences than clairvoyance.

Precognitive experiences were the most common (58 experiences; 61.7%); of these, 38 (65.5%) related to another person, while 20 (34.5%) related to the self. Precognition was followed by GESP (30 experiences; 31.9%) and retrocognition (6

experiences; 6.4%). The sexes did not differ in the types of ESP experienced (Fisher's exact test, $p = .901$), and there was no difference between the types of ESP in terms of the sex of the target person (Fisher's exact test, $p = .457$). This distribution differs considerably from the collections reported by Schouten, which were mostly, or entirely, telepathy cases and completely omitted retrocognition cases (Schouten 1979: 412, Schouten 1981: 16, Schouten 1982: 119). However, a majority of cases related to another person; this is an element of similarity between this collection and the others.

The difference between the collections is partly due to differences in selection of cases; for example, the *Phantasms* authors specifically collected telepathy cases (Gurney *et al*. 1886a: xix), while Rhine's collection was similar to the present study in not aiming to collect a specific type of case (Rhine 1951: 166). Schouten (1982: 40) suggested that differences in the reported forms of experience between case collections was indicative of cultural differences, and the same may be true of differences in the reported types of ESP. It is possible that there is a greater public understanding or acceptance of precognition in contemporary society; for example, there is evidence that televised depictions of ostensibly paranormal phenomena may influence viewers' paranormal beliefs (Sparks, Hansen & Shah 1994, Sparks, Nelson & Campbell 1997), although there does not appear to be any research evidence demonstrating greater understanding or acceptance of precognition specifically. Alternatively, this result may reflect differences in the solicitation of cases, since any examples that are provided to potential participants may influence the types of experience that are subsequently reported (Irwin & Watt 2007: 34). In the present study, the participant advertisements referred to both telepathy and precognition, so there was no bias towards the latter. It is possible that, during the lengthy period of

collection of Rhine's cases, examples tended to be given that related more specifically to telepathy, but again this is only a speculative explanation. It is conceivable that both of these processes could operate together; greater understanding or acceptance of a particular phenomenon may lead researchers to be biased towards providing examples of this phenomenon when collecting cases. This is a potential avenue for further research.

As discussed in the previous chapter, the lack of retrocognition cases in the previous collections was probably due to a tendency to interpret them as telepathy or clairvoyance (Dobinson 1998: 342), but they are still very much a minority in this collection. An example of retrocognition, in the form of an emotional intuitive experience, is given below[1]; this corresponds with Dobinson's (1998: 337) observation that such cases are often evoked by the percipient's presence in the relevant environment:

> Participant 1: "I rented out my flat to a young, soon to be married professional couple for a period of 11 months. After they moved out I inspected the property for damage and assessed the condition of the property. Once inside on my own I began to feel uncomfortable and felt anger build up inside me for no reason, as I was reasonably happy with the way the flat had been left. I decided to give it a good cleaning and this feeling of blind anger strengthened; I began at first to talk to myself out loud and soon this developed into swearing and shouting but I couldn't understand why. This continued for approximately one hour. My

[1] Participant quotations have been edited for spelling, grammar, clarity and brevity but care has been taken to retain the original meaning and detail.

neighbour (who had just arrived home from work and hadn't heard my swearing) called up to see me; I brought her in and I explained my behaviour but asked her not to confirm or deny what I was about to tell her until I finished my story. I went on to tell her that the couple had fought together; the woman had been thrown against the walls, hit on the body and had raging arguments with her boyfriend where doors were slammed. My neighbour confirmed everything and heard most of the fights due to the thin walls".

3.3.5. Form of Experience

The frequencies of the forms of experience are shown in Table 3.1 for all cases, GESP cases only, and precognition cases only. Experiences were primarily categorised into three main forms, namely dreams, intuitions and hallucinations, in line with Schouten's (1979, 1981, 1982, 1983) analyses. However, further subcategories were created within each form. As per Rhine's (1953a: 96, 101) categorisation, dreams were separated into realistic and unrealistic forms; realistic dreams were those involving a clear and realistic mental image that reproduced some or all of the event to which it seemed to be related, while unrealistic dreams contained imagery and detail with an unreal or fantasy content. Examples of these two forms are as follows:

Participant 56 (realistic dream): "I dreamt that my granddad had a fall in which he hurt his head. The following day he fell down the step outside his house and cut his head open".

> Participant 69 (unrealistic dream): “I had a dream in which I was flying and soaring past birds and planes. I then dropped from the sky into water, and immediately floated; this was odd to me as I cannot swim. I just considered the dream to be a consequence of drinking the night before, until I saw the news about the plane that crashed in the New York river after colliding with birds, and all passengers and crew survived”.

Intuitions were separated into three subcategories, as identified by Rhine (1953a). ‘Knowing’ cases were those involving a hunch, guess or idea; ‘emotional’ cases involved the experiencing of a sudden emotion; and ‘compulsive’ cases were those in which the experient felt suddenly compelled toward action. The case of retrocognition provided earlier gives an example of an emotional experience. Examples of knowing and compulsive cases are as follows:

> Participant 110 (knowing): “I came home from school and knew that something was wrong with my rabbit before I saw him. I went outside to see him and he was dying”.

> Participant 38 (compulsive): “I was due to fly to New York. When I got out my passport, I found that on my return date it had less than the required three months left until expiry. I had no annual leave left at work, and the Post Office could not guarantee that the passport would be returned in time to travel if I sent it for renewal. Something stopped me calling in sick to go to Peterborough to renew it in person, so I cancelled the trip and lost the flight money. My dad had

a massive fit the day after I was due to fly out, and had to have a twelve-hour operation to remove a cancerous tumour on his brain".

Table 3.1. Frequencies of forms of experience, for all cases, GESP cases only, and precognition cases only.

Form	All Cases		GESP Cases		Precognition Cases	
	Number	Proportion (%)	Number	Proportion (%)	Number	Proportion (%)
Dreams	59	62.7	10	33.3	45	77.6
- *Realistic*	*43*	*45.7*	*3*	*10.0*	*37*	*63.8*
- *Unrealistic*	*16*	*17.0*	*7*	*23.3*	*8*	*13.8*
Intuitions	26	27.7	15	50.0	10	17.2
- *Knowing*	*22*	*23.4*	*14*	*46.7*	*8*	*13.8*
- *Emotional*	*3*	*3.2*	*1*	*3.3*	*1*	*1.7*
- *Compulsive*	*1*	*1.1*	*0*	*0.0*	*1*	*1.7*
Hallucinations	6	6.4	3	10.0	2	3.4
- *Visual*	*3*	*3.2*	*1*	*3.3*	*1*	*1.7*
- *Auditory*	*2*	*2.1*	*1*	*3.3*	*1*	*1.7*
- *Somatic*	*1*	*1.1*	*1*	*3.3*	*0*	*0.0*
Combined	3	3.2	2	6.7	1	1.7

Hallucinations were separated into visual and auditory subcategories, as identified by Schouten (1979: 427), although there were no examples with a combination of visual and auditory aspects. However, a 'somatic' category was added to include cases involving bodily sensations such as touch, pain and illness, similar to those identified by Rhine (1953a: 93-95). Examples of visual, auditory and somatic hallucinations are as follows:

> Participant 30 (visual): "I was walking to my next class at college, and glanced up to see where I was walking, and in the reflection of the window in front of me I saw my best friend (who was 100 miles away in the army) crying hysterically. I looked behind me but she wasn't there. I rang her as soon as I could (she was still at the army base), and that morning she had found out her uncle had died and had been crying all day".

> Participant 26 (auditory): "One night as I was falling asleep I heard a bang as if something had fallen. I got up and looked around but could not find anything that made the noise. I went to sleep and thought nothing of it. The next day I went out for a carnival and stayed out all day. That evening I was walking to a beach party with my friend and we both ended up falling down a cliff, which resulted in my friend dying and me being paralysed. The noise I heard of something falling must have been a warning of what was going to happen".

> Participant 116 (somatic): "My partner was working away and I felt a little nervous at home on my own. As I was falling asleep I felt someone touch my head and pull it up; it felt warm, and like it was pulling me out of the bed. I

went to the toilet and went back to bed. In the morning I woke up and found someone had broken into my garden."

Most of the cases could be placed in one of the categories but in three instances this was not possible, so these were assigned as 'combined'. An example is given below in which there are intuitive (knowing) and hallucinatory (somatic) aspects:

Participant 83: "There was a time when a relative was ill; I had a funny feeling and kept thinking about her. I felt a feeling of pain in the left side of my eye. When I called to check on her she was going into hospital to have her left eye removed, to be replaced by a glass artificial eye".

The distribution for all cases broadly replicates that of the Sannwald and Rhine collections (Schouten 1981: 25, Schouten 1982: 130, 150), with dreams most prevalent, followed by intuitions and hallucinations, supporting hypothesis 5. The separation into GESP and precognition cases further replicates the similar separation of Rhine's cases (Schouten 1982: 150). As with Rhine's telepathy cases, this collection's GESP cases show a higher proportion of intuitions than dreams, while dreams are by far the most prevalent in precognition cases; this difference between the two types of cases was significant (Fisher's exact test, $p = .001$). Furthermore, there was no difference between precognition cases with a target person and those that related to the self, in terms of the form of experience (Fisher's exact test, $p = .111$), demonstrating that this difference in forms relates to the difference in the ostensible type of ESP, rather than the presence or absence of a target person. The sexes did not differ in terms of the forms of experience (Fisher's exact test, $p = .801$), and there was

no difference between the forms in terms of the sex of the target person (Fisher's exact test, $p = .754$).

3.3.6. The Event

The frequencies of the events are shown in Table 3.2 for all cases, GESP cases only, and precognition cases only. For consistency, Schouten's 'slight injuries' category was altered to 'minor illness/accident' to match the 'serious illness/accident' category. It was felt that Schouten's categories were largely adequate, except for the absence of emotional matters. A 'serious emotional' category was therefore added for situations such as relationship breakdown or divorce, grief (where the experience appeared to be related to the grief rather than the death that had caused it), or any other traumatic experience that did not involve any kind of accident, illness or injury. An example of an experience involving grief was provided in the earlier example of a visual hallucination, in which the 'message' appeared to relate to the grief of the friend, rather than to the death of the friend's uncle.

A 'minor emotional' category was added for situations such as a general low mood, or a slightly unnerving experience such as being stopped and searched by a policeman, as in the following realistic precognitive dream:

> Participant 73: "I had a dream, a few years ago. It wasn't exactly how it turned out. I dreamt I was stopped and searched at the train station. It felt bizarre because it was actually me but I couldn't control speech or movement. The policeman searched my bag and told me to follow him into a room. He said

something that I can't recall, but I remember panicking, getting angry and then suddenly waking up. I think a few days later walking through Birmingham New Street station I was actually stopped by a policeman and my bag searched; he thanked me and said I could go".

Table 3.2. Frequencies of events, for all cases, GESP cases only, and precognition cases only.

Event	All Cases		GESP Cases		Precognition Cases	
	Number	Proportion (%)	Number	Proportion (%)	Number	Proportion (%)
Death	16	17.0	6	20.0	9	15.5
Serious illness/accident	18	19.1	5	16.7	13	22.4
Minor illness/accident	9	9.6	2	6.7	6	10.3
Serious emotional	9	9.6	7	23.3	2	3.4
Minor emotional	6	6.4	2	6.7	4	6.9
Serious material	2	2.1	0	0.0	2	3.4
Slight material	3	3.2	1	3.3	2	3.4
Trivial	17	18.1	6	20.0	7	12.1
Positive	14	14.9	1	3.3	13	22.4

Previous case collections have all found deaths to be the most prevalent event (Schouten 1979: 432, Schouten 1981: 29, Schouten 1982: 133), but they were the third most common experiences here, behind serious illness/accidents and trivial cases. However, the present collection was similar in containing predominantly negative events (67.0%), supporting hypothesis 6, and in containing a very low proportion of cases relating to material damage. The lower proportion of death cases may be due to the high proportion of undergraduate student participants in the sample, who are likely to have experienced fewer deaths than older participants. One may also expect younger individuals to think and worry about death to a lesser extent than older individuals; however, research has consistently demonstrated that younger adults report higher levels of death anxiety than older adults (Russac *et al*. 2007: 549), so this suggestion is not well-supported.

The proportions of trivial and positive events are also slightly higher in the present collection than in those reviewed by Schouten. Again, this may be due to the high proportion of student participants in the sample; for example, trivial events may be more prevalent due to the tendency for students to take part to gain research participation credit, submitting trivial cases that would be unlikely to be reported elsewhere. Numbers of positive cases may also be elevated due to the potential for student participants to have more positive life milestones in a relatively short period of time; for example, several cases related to successful exam results. However, the figures are only slightly above those of 14.1% and 11.2% from the Sannwald collection for trivial and positive cases respectively (Schouten 1981: 29), suggesting this has not had a large overall effect on the distribution. This issue will be returned to later.

The distributions for GESP and precognition cases were significantly different (Fisher's exact test, $p = .046$). GESP cases contained more trivial events, similarly to the comparison between Rhine's telepathy and precognition cases (Schouten 1982: 151), as well as more serious emotional events. The larger proportion of trivial events appears to be due to the inclusion of several cases where the percipient reported knowing what another individual in close proximity was thinking at that moment. Precognition cases contained more positive events, again similar to Rhine's collection (Schouten 1982: 151) although to a more pronounced degree; however, precognition cases also contained more illness/accident events, unlike those of Rhine. Given that a large proportion of precognitive experiences occur in dreams, it may be that percipients' dreams are more likely to play out their positive hopes for the future or their legitimate worries and concerns.

It was also examined whether there was any association between the type of event and the presence or absence of a target person. To take account of the relatively large number of event categories and the relatively low number of self-target experiences, for this analysis some of the event categories were collapsed to create four categories: serious, minor, trivial and positive; death cases were excluded due to the fact that those relating to the self could not have been reported (see Table 3.3). There was a significant association such that, compared to experiences with a target person, experiences relating to the self were less likely to be serious and more likely to be positive: χ^2 (1, $N = 75$) = 13.4, $p = .004$, $V = .423$. The lower frequency of serious events in self-target cases supports hypothesis 7 and the findings of Schouten (1981: 45, 1982: 153). The greater proportion of serious events in cases with a target person also supports Schouten's (1979: 434-435) suggestion that events posing a threat to the

relationship between the percipient and target person are more likely to be represented as an ESP experience; however, this in itself does not imply a paranormal cause. The proportion of trivial events was very similar in both types of experience, which does not support the hypothesis or Schouten's findings. The possible reason for the numbers of trivial cases with a target person and positive cases relating to the self has been discussed earlier. However, it seems that the findings in general represent the tendency for non-serious events to be more common occurrences in one's own life.

Including all 94 cases, the collection as a whole has a slight minority (47.9%) of serious events, in contrast to Schouten's findings (Schouten 1979: 432, Schouten 1981: 29, Schouten 1982: 133). To examine whether the inclusion of a high proportion of student participants had affected the overall distribution, chi-square analysis was performed comparing the student and non-student participants in terms of the four collapsed categories of event type. Students showed a slight tendency to report more trivial and positive events and fewer serious events, but not to a significant degree: χ^2 (3, N = 94) = 2.54, p = .469, V = .164. Therefore, it seems likely that the high proportion of non-serious events may be due to the more relaxed acceptance criteria of the present study, in which participants were not required to have strong conviction in the extrasensory nature of their experience, coupled with the relative ease and anonymity of completing an online questionnaire in comparison to writing a letter.

Table 3.3. Frequencies of serious and non-serious events, excluding deaths, for experiences with a target person and experiences relating to the self.

Event type	Target person present	Relating to the self	Total
Serious	26	3	29
Minor	12	6	18
Trivial	10	4	14
Positive	5	9	14
Total	53	22	75

Differences between the sexes were examined using the four collapsed categories of event type. The sexes did not differ in terms of event category (Fisher's exact test, p = .231). In terms of the target person, males were more often involved in serious events compared to females, but this was not significant (Fisher's exact test, p = .085). This result had been found in the older collections but was relatively weak and inconsistent (Schouten 1982: 142, 149); thus a significant result was not expected.

3.3.7. Content of the Experience

3.3.7.1. Identification of the Target Person and Event

There were 69 experiences with a target person where the identity of the target was not obvious from the percipient's situation. In 56 (81.2%) of these the target person was identified in the experience; this corresponds very closely to the figures of approximately 80% in all three collections analysed by Schouten (Schouten 1979: 435, Schouten 1981: 30, Schouten 1982: 134). There were 91 experiences where a

specific event was involved and it was clear whether or not the event had been identified in the experience. In 66 (72.5%) of these the event was identified in the experience; this closely corresponded to the figure of 72.8% from the Sannwald collection (Schouten 1981: 30) and was lower than the figure for identification of the target person, supporting hypothesis 8. This also supports Schouten's (1979: 435) suggestion that the fact that something has happened to the target person is more important than the specifics about what has happened. Schouten (1979: 435) interpreted this in an ESP context, but this could also be interpreted in a normal manner. It may be the case that individuals are more likely to have concerns, thoughts, dreams etc. regarding a specific person than a specific event. If so inclined, any notable event that then happens to that person may be interpreted as an ESP experience. One would therefore expect that there would be proportionally more cases where only the target person is identified than cases where only the event is identified. There is some evidence to support this, demonstrated by the significant association displayed in Table 3.4: χ^2 (1, N = 66) = 9.58, p = .002, Φ = .381. When the event was not identified, a majority of percipients did identify the target person, whereas when the target person was not identified, a minority of percipients identified the event. However, the overall significance of the association appears to be due to the tendency to either identify both event and target together, or identify neither. This may reflect a general inclination of many percipients to only interpret an experience as ESP if both key aspects are included.

Table 3.4. Frequencies of identification of the target person and event.

	Event identified	Event not identified	Total
Target person identified	43	10	53
Target person not identified	5	8	13
Total	48	18	66

The sexes did not differ in terms of their identification of the event (χ^2 (1, N = 91) = 1.44, p = .229, Φ = .126) or the target person (χ^2 (1, N = 69) = 0.106, p = .745, Φ = .039), supporting Schouten's findings (Schouten 1979: 435-436, Schouten 1981: 30-31, Schouten 1982: 135) and in line with his suggestion that the sexes do not differ in ESP ability (Schouten 1983: 330). In a non-ESP context, this could simply reflect that the sexes do not differ in their tendency to interpret an experience as paranormal based on whether or not these aspects were identified. However, there was a significant association between the sex of the target person and their identification, as shown in Table 3.5; female target persons were significantly more likely to be identified than male target persons: χ^2 (1, N = 57) = 5.78, p = .016, Φ = .318. Given the higher proportion of female target persons in this collection this may reflect a tendency to interpret a case as ESP based more on a match of the target person rather than the event; however, the results previously described (relating to the data in Table 3.4) do not support this. An ESP interpretation may be that females are somehow better as 'agents'. Schouten (1982: 335) proposed that, although the percipient's role appears to be key, the target person can play a role by attracting attention; however,

this would only apply for GESP (telepathy) cases. An alternative is that this result is an artefact from the conducting of multiple analyses; this chapter contains 31 analyses examining the associations and differences between a variety of variables. Correcting for the number of analyses is not straightforward; an overall Bonferroni correction of the alpha level would render it very difficult for any of the analyses to reach significance, while the interrelatedness of many of the analyses renders it problematic to categorise 'families' of tests. However, if one considers analyses examining either the sex of the target person, or their identification, as one such 'family', then this includes 12 analyses, leading to a familywise error rate of 46% and a Bonferroni-adjusted alpha level of .004 (Field 2013: 68-69). Thus, this may suggest that the apparent association between the sex of the target person and their identification is an artefact due to multiple analyses.

There was no difference between the three main forms of experience (dreams, hallucinations and intuitions) in terms of identification of the target person (Fisher's exact test, $p = .428$), contradicting Schouten's (1979: 443) finding that the person was most commonly identified in hallucinations; however, the low number of hallucination cases in this collection precludes any firm conclusions. There was a significant difference between the three main forms of experience in terms of identification of the event (Fisher's exact test, $p < .001$), as shown in Table 3.6. As found by Schouten (1979: 443), identification of the event was highest in dreams; hypothesis 9 was thus partly supported. The tendency for dreams to be detailed experiences may explain their increased ability to ostensibly correspond with a real-life event. This holds for an explanation involving coincidence, but also for one involving ESP; Schouten's (1983: 337) ideas regarding the "creative activity" of the

percipient in producing their experience also suggest that a dream ESP experience is largely a fantasy based on the essential ESP information and knowledge of the situation of the target person (be that person the self or another).

Table 3.5. Frequencies of cases in which the target person was and was not identified, by sex of the target person.

Sex of target person	Target person identified	Target person not identified	Total
Male	18	8	26
Female	29	2	31
Total	47	10	57

There was no difference between GESP and precognition cases in terms of identification of the target person (χ^2 (1, N = 64) = 0.032, p = .859, Φ = .022) or identification of the event (χ^2 (1, N = 88) = 2.03, p = .155, Φ = .152). There were also no clear associations between the seriousness of the event and identification of the target person (Fisher's exact test, p = .097), or between the seriousness of the event and identification of the event (Fisher's exact test, p = .119).

Table 3.6. Identification of the event, by form of experience.

Form of experience	Event identified	Event not identified	Total
Dreams	49	7	56
Intuitions	16	10	26
Hallucinations	1	5	6
Total	66	22	88

3.3.7.2. Conviction

Rhine (1962a: 92) defined a case as demonstrating conviction in situations where participants either stated their certainty that their impression was true, or took some relevant action due to the experience. Upon examination of this element of cases, it became clear that a convinced/unconvinced dichotomy was unsatisfactory, since in many cases the participant was concerned or worried by their experience, even to the point where they may tentatively speak to others about it, but they were not completely convinced that it was, or would be, veridical. A 'partial' category was therefore included for cases of these types. Percipients were categorised as convinced if they specifically stated their conviction or knowledge in the truth of the 'message', or if they spoke to someone or took action in a manner that conveyed this conviction; percipients were categorised as unconvinced if they clearly disregarded the experience. Three cases in which the level of conviction was unclear were removed from the subsequent analyses.

Of the 91 cases included, full conviction was demonstrated in 21 (23.1%), partial conviction was demonstrated in 29 (31.9%) and lack of conviction was demonstrated in 41 (45.1%). The sexes did not differ in their level of conviction (Fisher's exact test, $p = .751$), supporting the results of the Sannwald collection (Schouten 1981: 31). In the *Phantasms* and Rhine collections males showed more conviction than females, although Schouten (1979: 436, 1982: 135) seems to provide contradictory statements regarding whether or not these results achieved significance; overall it appears that sex and conviction are not strongly or consistently related. Level of conviction also

did not differ depending on the sex of the target person (χ^2 (2, N = 55) = 0.266, p = .876, V = .070).

There was a significant difference between the forms of experience in terms of conviction (Fisher's exact test, $p < .001$), with intuitions showing the most conviction and dreams showing the least (see Table 3.7); this supports hypothesis 10 and the findings of Schouten (Schouten 1979: 437-438, Schouten 1981: 31, Schouten 1982: 135). Given that most intuitive experiences were of the 'knowing' kind, the high level of conviction is unsurprising, while the low level of conviction in dreams was clearly apparent from numerous respondents who initially disregarded their experience as "just a dream". There was also a significant difference between GESP and precognition in terms of conviction (χ^2 (2, N = 85) = 9.88, p = .007, V = .341), as shown in Table 3.8, with GESP experiences involving more conviction than precognition; this would appear to be explainable by the prevalence of intuitions in GESP experiences and the prevalence of dreams in precognitive experiences.

Table 3.7. Conviction levels by form of experience.

Form of Experience	Full Conviction	Partial Conviction	No Conviction	Total
Dream	4	15	33	52
Intuition	13	8	4	25
Hallucination	1	2	2	5
Total	18	25	39	82

Table 3.8. Conviction levels by type of ESP.

Type of ESP	Full Conviction	Partial Conviction	No Conviction	Total
GESP	12	8	9	29
Precognition	7	17	32	56
Total	19	25	41	85

There was no association between seriousness of event and conviction (Fisher's exact test, p = .537). There was also no association between conviction and identification of the target person (Fisher's exact test, p = .847), or between conviction and identification of the event (χ^2 (2, N = 88) = 1.41, p = .494, V = .127). Identifying the target person was associated with taking action (an element of conviction) in the Rhine collection (Schouten 1982: 135), but not in *Phantasms* or the Sannwald collection (Schouten 1979: 436, Schouten 1981: 31); the results of the present study thus suggest that this finding was specific to Rhine's cases.

3.3.7.3. Details

Although Schouten performed several analyses regarding the number of details in experiences, he acknowledged issues due to the difficulty of defining a detail, the fact that incorrect details were rarely reported, and the tendency for the percipient to have already had some knowledge of the target person's situation and thus have built this into the description of their experience (Schouten 1979: 438-439). These same issues were encountered in this collection, in addition to the inclusion of occasional generic comments that the event matched the experience "down to the last detail". As

discussed in the previous chapter, an experience containing the information "John is dead" is easy to interpret as containing information regarding the target person and event, but with no additional details. However, in an experience containing the information "John has broken his phone", the distinction between the identification of the event and the details included is more difficult. For these reasons, analyses of details were not performed in this study.

3.3.8. Precognitive Experiences: Taking Action

In the previous analyses, taking action has been considered an element of partial or complete conviction in the veridicality of the ostensibly extrasensory information. Precognitive experiences are of particular interest in this respect, due to the potential ability of the percipient to change the course of events. However, as discussed earlier, precognitive experiences most often occur in dreams, which carry the least amount of conviction, and so relatively few percipients attempted to take any action of this kind. Of the 58 participants who reported precognitive experiences, only 11 (19.0%) attempted action. One of these was part of the compulsive intuition presented earlier, where the participant cancelled a flight the day before his father was taken ill. In 7 cases the participant spoke to other individuals as a warning; one of these cases is of particular interest, since the participant believes the warning may have actually caused the incident:

> Participant 115: "My older sister was driving to work, but on the way she was hit by a car coming out of a junction. Her car spun and flipped over and nearly hit a van full of gas, but she was fine. Shortly before the crash happened I had a

real desire to go in her room, so I did and lay on her bed. I closed my eyes and saw myself in the position of my sister during the crash, even though it was a couple of hours before. In my 'dream' the ending was different to what actually happened to my sister; I was thrown out of the car window as it flipped but the car landed on my legs. I started getting slightly agitated due to how realistic the 'dream' was, so I phoned her, but she was fine and hadn't even got in the car from her friend's house yet. I told her about the dream and she told me not to be silly. About five hours later I got a phone call from my mum saying my sister had been taken to hospital as she was in a hit-and-run car crash. We were both amazed by what I saw, but when we've talked about it we think the fact I brought up the idea of a crash could have led to her driving differently, increasing the chance of her crashing."

In a further case a participant had a dream in which she was warned not to go to a concert with her aunt; she made an excuse not to go and avoided her aunt's subsequent car accident. Another case, low on evidential value, involved a participant dreaming of passing an exam, which caused her to revise more thoroughly and therefore pass. Finally, the following case indicates an example where the participant showed no conviction in their experience, but subsequently took action that appears to have prevented the event taking place:

Participant 97: "I had a dream that I couldn't quite remember but I woke up feeling that I was going to be trapped and that my holiday was going to go very wrong. The next day I went on holiday to Mallorca, and the day after that we went to the beach. We went cliff jumping and just as it was my turn to go I

remembered the dream. I patted my loose pockets and turfed out of them my wallet and my passport. If I had jumped they would certainly have come out, and then I would have been trapped in a foreign country with no money, ID or passport to get home".

This example also illustrates an important point regarding the definition of conviction in an experience. Rhine (1962a: 92) defined cases as demonstrating conviction if a participant took some relevant action due to the experience; however, the above example demonstrates that action can be taken without conviction.

3.3.9. Reactions to the Experience

3.3.9.1. Short-Term Reactions to the Experience

Short-term reactions to the experience, before ostensible confirmation was obtained, are presented in Table 3.9; note that for this and subsequent questions many participants gave more than one response. The most common response was to disregard the experience, but worry or concern, fear, and confusion or lack of understanding were also reported relatively frequently. Several participants saw their experience as simply strange or unusual, but were otherwise unaffected, while others found it curious, interesting or intriguing. These more frequently reported responses are similar to those of Milton (1992: 317), whose participants reported curiosity, puzzlement and fear. A range of other reactions were reported somewhat less frequently, including constantly thinking of the experience, surprise and denial; other more idiosyncratic responses were also reported by individual participants, such as

being disappointed that a dream of a positive experience was not real, or a feeling of coming back in time from an ostensibly precognitive dream.

Table 3.9. Frequencies of short-term reactions to the experience, before ostensible confirmation (from 94 participants).

Response Category	Frequency
Disregarded	30
Worry or concern	13
Fear	12
Confusion or lack of understanding	11
Strange or unusual experience	8
Interested or intrigued	6
Strong conviction	6
Continually thought of it	3
Disturbed or ‘spooked’	3
Sadness or upset	3
Shock	3
Calm/relaxed	2
Denial	2
Partial conviction (thought it may occur)	2
Prayed it would not happen	2
Surprise	2
Acceptance	1
Anguish	1
Astonishment	1
Disappointed it was not real	1
Doubtful	1
Drained	1
Empathy	1
Feeling of going backwards in time	1
Increased self-belief and confidence	1
Safe	1
Stressed	1
Trauma	1

3.3.9.2. Short-Term Reactions to Confirmation of the Experience

Short-term reactions to the ostensible confirmation of the experience are presented in Table 3.10. Negative emotions were commonly reported, including shock, confusion and fear, in addition to less intense emotions such as being ‘spooked’, surprised or simply considering it as an unusual experience. Several participants reported a feeling that they were disappointed with themselves for not heeding the apparent warning from their experience, or that they could have done more to prevent the event from happening. Several participants did report positive emotions, such as pleasure due to the event itself being positive, happiness that they felt they had said goodbye to a dying relative, or relief that the experience had an apparent meaning. The comparison between these two sets of reactions, firstly to the experience and then to its confirmation, has included an aspect that was not covered by Milton (1992). It appears that the initial experience has negative emotional effects on many percipients, but is also commonly disregarded; however, upon ostensible confirmation there is often a sense of shock or at least an acknowledgement that the experience is somehow extraordinary. Fear and confusion are common at both the experience and confirmation stages. Overall it would appear that these experiences are in many cases capable of inducing strong and negative emotions, particularly at the confirmation stage; however, a number of participants responded positively to their experience or were relatively unaffected by it.

Table 3.10. Frequencies of short-term reactions to ostensible confirmation of the experience (from 94 participants).

Response Category	Frequency
Shock	15
Confusion or lack of understanding	14
Strange or unusual experience	14
Fear	12
No effect or did not think about it	12
Considered a normal explanation	10
Disturbed or ‘spooked’	10
Surprise	7
Could/should have heeded warning	6
Disbelief	5
Happy or glad	5
Sadness/depression	5
Amazement	4
Déjà vu	4
Worry or concern	3
Calmness or peacefulness	2
Physical sensations	2
Played on mind	2
Pleased with self	2
Questioned own experience or sanity	2
Acceptance	1
Comforted	1
Detachment from body	1
Excitement	1
Felt a connection to deceased relative	1
Guilt; felt to blame for the event	1
Interested	1
Numbness	1
Relief that the experience had meaning	1
Should follow gut feelings more often	1
Trauma	1
Wanted to discuss it with someone	1

3.3.9.3. Long-Term Effects of the Experience

Long-term effects of the experience are presented in Table 3.11. As in Milton's (1992) sample some participants reported little effect on their lives, whilst others were more strongly affected. Increased paranormal belief was the most commonly reported response, with two participants stating that they disliked having apparent psi ability. A relatively large number of participants reported no effects or rarely thinking about their experience, while the third largest category of response was for participants who were satisfied that they had obtained a normal explanation for the occurrence. Other participants still reported relatively strong negative emotions such as fear and shock, but for most participants the initial strong reactions to the confirmation of the experience had been replaced with milder forms of reaction such as feeling 'spooked' or confused. Broadly speaking there appear to be three categories of participants; there are those who appear convinced as to the paranormality of the experience, those who are satisfied with a non-paranormal explanation, and those who remain intrigued by or unsure of the cause of their experience.

Table 3.11. Frequencies of long-term effects of the experience (from 94 participants).

Response Category	Frequency
Increased paranormal belief	29
No effect or rarely think about it	18
Normal explanation	11
Confusion or lack of understanding	8
Disturbed or ‘spooked’	7
Happy or glad	7
Interested or intrigued	6
Strange or unusual experience	6
Fear	5
Trust intuitions more	5
Déjà vu	4
Could/should have heeded warning	2
Disbelief	2
Increased religious belief	2
One-off event	2
Unhappy at having psi ability	2
Anger	1
Could not have stopped event	1
Desire to meet others with psi ability	1
Guilt; felt to blame for the event	1
Increased self-belief	1
Large impact (unspecified)	1
Memorable experience	1
Pray for understanding	1
Questioned own experience	1
Sadness/depression	1
Shock	1
Surprise	1
Worry	1

3.3.10. Telling Others of the Experience

3.3.10.1. Choice of Confidants

Most participants had told someone else of their experience; only 12 (12.8%) had not. Of the latter group, half feared disbelief or ridicule from those they told; these were similar responses to those obtained by Milton (1992: 318-319). Two participants considered their experience of no real importance, while one participant felt nothing could be gained from telling others and one had not worked out how to approach the topic in general conversation. One participant wanted to forget about their experience, while another appeared more traumatised by the event than the experience and did not want to discuss this event with others.

Participants who told someone else of their experience invariably told either friends or family; one participant also reported telling a clairvoyant, while another reported telling a church pastor. Reasons for telling those people are presented in Table 3.12. Participants answered the question in slightly different manners; some appeared to explain why they told a particular person, while others appeared to explain more generally why they reported their experience. Similarly to Milton's (1992: 319) findings, the most common choice was to tell people who were considered close, trustworthy or non-judgmental, while other people were told due to their belief in, or experience of, ostensibly paranormal events; this perhaps indicates an element of confirmation bias (e.g. Nickerson 1998). Others were told due to their involvement in the experience or event, sometimes as a warning (as discussed earlier in the chapter), or because they witnessed the percipient having their experience. Other percipients

recounted their experience due to its inherent interest value, or because they desired help from others in understanding what had occurred.

Table 3.12. Frequencies of responses to the question, "Why did you choose to tell that particular person, or those particular people?" (from 82 participants).

Response Category	Frequency
Close/Trusted/Non-judgmental	25
Part of the experience or event	17
Interesting experience	15
Paranormal believer/had similar experiences	9
Witnessed the experience or event	7
First available person	6
Trying to understand experience	6
Knew or were close to the target person	5
Came up in general conversation	5
As a warning	4
They confirmed the experience	3
Obtain comfort	3
Provide comfort	1

3.3.10.2. Reactions of Those Told

Due to the generally careful choice of confidant, the reactions of those told (see Table 3.13) were mostly sympathetic, either in terms of interpreting the experience as positive, expressing a similar level of shock or surprise to the percipient, demonstrating a general interest in the experience, or simply listening and taking the account seriously; several confidants subsequently reported their own similar experiences. Alongside shock, the most common response was that of a relatively absent reaction; some confidants proposed normal explanations for the experience, but few reacted in an overly negative manner, with only a small number seeming to overtly disbelieve the percipient's account. These reactions would appear to be broadly similar to those obtained by Milton (1992: 319), although her finding that some relationships had worsened, due to the confidant's negative reaction, was not apparent in this study.

Table 3.13. Reactions of individuals who were told about the experience (from 82 participants).

Response Category	Frequency
No specific reaction	13
Shock	13
Interested	11
Considered it strange or unusual	10
Proposed normal explanation	9
Surprise	8
Reported own experiences	7
Took account seriously	7
Understanding or supportive	5
Amazement	4
Confused or puzzled	4
Disbelieved	4
Humour	4
Unnerved or ‘spooked’	4
Entered into a general discussion	2
Implored to take the experience as positive	2
Upset	2
Comforted	1
Fear	1
Learnt from experience	1
Mentioned a psychic relative	1
Worry	1

3.3.10.3. The Effect of the Reactions of Those Told

Responses to the confidant's reaction are presented in Table 3.14. By far the most common response was that the reactions had no discernible effect on the participant; it would appear that participants were largely firm in their belief regarding the cause of the experience before discussing it, or were successful in choosing confidants who would not strongly challenge their interpretation. The second most common response, from 7 participants, was that that of an increased or confirmed belief in a paranormal interpretation of the experience, while only 4 reported that they were subsequently more in favour of a normal interpretation. Other participants reported positive outcomes, such as being comforted or being proud of their experience or apparent paranormal ability; however, a minority reported negative outcomes such as feeling guilt, confusion, or that they were a strange person. Nevertheless, for the majority of participants it would appear that discussing their account did not result in a negative experience.

Table 3.14. Responses to the reactions of individuals who were told about the experience (from 82 participants).

Response Category	Frequency
No effect	39
Increased/confirmed paranormal interpretation	7
Comforted	6
Increased/confirmed normal interpretation	4
Strange occurrence	3
Guilt/shame	2
Proud of experience/ability	2
Uneasy/edgy	2
Amazement	1
Confusion	1
Curiosity	1
Disliked reaction	1
Fear	1
Felt like a good friend	1
Felt like a strange person	1
Felt worse	1
Humour	1
Increased ambivalence	1
Upset	1

3.3.11. Interpreting the Experience

3.3.11.1. Non-Paranormal Explanations Considered

The non-paranormal explanations considered by participants for their experiences are presented in Table 3.15. Approximately two-thirds of participants had considered some form of normal explanation, with coincidence, the expectation of a likely outcome, and the possibility of obtaining information via ordinary sensory channels as the most common responses. Smaller numbers of participants demonstrated knowledge of issues such as memory errors or subjective validation (although the latter term was not used specifically). The finding of most interest was that approximately one-third of participants had either not considered a non-paranormal explanation or had failed in their search for one. Research suggests that beliefs may influence the search for alternative explanations, with paranormal believers less receptive than sceptics to belief-disconfirming information (e.g. Jones & Russell 1980); thus it is plausible that percipients who had strong paranormal beliefs may have been satisfied with a paranormal conclusion and therefore not considered other possibilities. However, this category contained a number of cases that were low on evidential value, including a participant who had a shared dream with her sister, a participant who dreamed of receiving her examination results, and a participant who recalled a dream upon seeing an identical movie scene in a cinema. It was expected that, particularly in cases such as these, participants would at least be able to conceive of potential normal explanations such as coincidence, even if they ultimately favoured a paranormal interpretation. It is therefore somewhat surprising that so many participants were unable or unwilling to consider a non-paranormal explanation even as a slight possibility. Given the potential for participants to provide more detail on, or

exaggerate, aspects of their accounts that favour their preferred interpretation (e.g. West 1948b: 279-281), researchers should be aware of this tendency for a fairly large minority of participants to exclusively consider a paranormal version of events.

Table 3.15. Non-paranormal explanations considered (from 94 participants).

Response Category	Frequency
None	32
Coincidence	25
Expectation/hope/worry of likely outcome	8
Sensory leakage	7
Unknown scientific explanation	5
Déjà vu	3
Imagination	3
Caused the event from knowledge of experience	2
Memory error	2
Repetition of earlier event	1
Subjective validation	1

3.3.11.2. Reasons for a Paranormal Interpretation

Seven participants either stated that they had concluded their experience was not paranormal, or that they were unsure as to the cause of their experience. The reasons given by the remaining participants for a paranormal explanation for their experiences are presented in Table 3.16. Reflecting the previously described findings, the most common response was simply that no normal explanation was sufficient, followed by

the fact that there was a compelling correspondence or coincidence between the experience and event. One participant intriguingly described their experience as "too coincidental to be a coincidence", while other participants expressed similar sentiments. Tentatively, these situations may indicate examples of the operation of the cognitive bias of illusory superiority (e.g. Hoorens 1993: 117), where participants deem coincidences that occur to them as more compelling than coincidences that occur to others. Some participants ascribed a paranormal cause either due to the uniqueness or unusual nature of the experience itself, or to that of the event to which it seemed to be related. While some participants saw uniqueness as indicating the paranormal nature of the experience, others considered a paranormal aspect to be indicated by similar experiences occurring on more than one occasion, as if indicative of a genuine process rather than a peculiarity. A smaller number of participants made paranormal attributions based on similar experiences of friends or family members.

Table 3.16. Reasons given for a paranormal explanation for experiences (from 87 participants).

Response Category	Frequency
No normal explanation is sufficient	24
Coincidence/correspondence between experience and event	22
Unique or unusual experience	10
Happened on more than one occasion	9
Unique or unusual event	4
Other people had similar experiences	3
Family trait	2
Multiple experiences for one event	2
Read about ESP experiences	2
Unexpected occurrence	2
Vividness of experience	2
Clarity of 'message'	1
Confidence in the phenomenon witnessed	1
Experience provided a lesson	1
Faith and religion	1
Friends suggested paranormal nature	1
Intelligence and understanding	1

3.3.12. Good Quality Cases

Similar to the findings of West (1948b: 299), relatively few good quality cases were reported that made a compelling argument for the possible occurrence of ESP. The

judgement of what determines a ‘good’ or ‘compelling’ case is necessarily somewhat subjective, but there are several features of cases that may be interpreted as qualitatively more impressive than others. For example, vivid, detailed experiences are more striking than vague impressions, particularly when multiple precise details are ostensibly confirmed. If the experience is of an unusual or unexpected nature, such as a visual hallucination, then this also lends a more exceptional quality to the experience than if it was an ordinary dream or a simple thought. An unusual or unexpected event further adds to the apparent impressiveness of a case, since it appears less probable that the experience may have occurred due to expectations or concerns about a likely scenario. Finally, a very clear correspondence in time between the experience and event would seem to reduce the likelihood of purely coincidental similarity between these two occurrences, due to the lower probability of two independent incidents taking place concurrently as opposed to during a more extended period of time. In the present collection, two cases in particular appeared to satisfy the majority of these criteria, and are presented below; one has been presented earlier in the chapter but is repeated here for convenience:

> Participant 10: “In 2003 my husband went to Florida on business. He arrived in the evening USA time and I had already gone to bed in the UK. At 5:30 UK time I woke with a start from my sleep, very agitated; I sat up in bed and kept holding my head, feeling nauseous and in an increasingly agitated state. I even spoke out loud to myself, asking what was wrong with me. At that moment the phone rang; it was my husband in a terrible state. It was the early hours of the morning in the USA, and he had gone to the bathroom in his hotel; he had walked into a glass partition in the room and it had shattered, splitting his head

> open and leaving blood everywhere. He was concussed and had phoned me as he didn't know what to do. It was all eventually resolved but to this day I am quite sure I was feeling his heightened anxiety and pain as it happened, and this brought me out of my sleep".
>
> Participant 30: "I was walking to my next class at college, and glanced up to see where I was walking, and in the reflection of the window in front of me I saw my best friend (who was 100 miles away in the army) crying hysterically. I looked behind me but she wasn't there. I rang her as soon as I could (she was still at the army base), and that morning she had found out her uncle had died and had been crying all day".

Both of these cases include vivid, unusual and unexpected experiences, and seem to refer to unusual and unexpected events. Furthermore, in both cases there was immediate confirmation of the temporal correspondence between the experience and event. The only feature in which these cases are lacking is the level of detail involved in the experience; participant 10 was unaware of the target person or event, while participant 30 identified that her friend was upset but was unaware of additional details such as the cause of her distress. Therefore, although impressive in comparison to many of the cases in this collection, even the best cases do not fully satisfy the criteria for a truly 'good' or 'compelling' case. It is also worth reiterating that even an apparently outstanding case cannot be used as evidence for ESP; related to this point, the experience of participant 30 is discussed further in the next section.

3.3.13. Evidentially Weak Cases

Examples of cases have been presented in the previous section that appear relatively compelling cases of ostensible ESP, at least within the limitations of a self-report study. However, there were also a number of cases that appeared very weak in terms of evidence for an anomalous process, such as the case mentioned earlier involving a participant passing an exam following motivation by a dream of passing the exam. Several other participants also experienced veridical dreams of exam grades, which appeared to be due to expectations or hopes, since students are often aware of their predicted grades. A number of experiences related to participants who were aware that their relative was dying, and had an experience that appeared to coincide with their death; again, these would appear to be due to expectation of a high-probability event (e.g. West 1948b: 272).

One participant in particular provided an interesting example of how, with further questioning, a more mundane explanation for the experience can become apparent. This participant described their experience as follows:

> Participant 39: "Two of my friends were talking about something that one of them had promised to lend the other. They couldn't remember what it was that my friend wanted to borrow. I was not there when the conversation took place but I said the word 'ink'; that was what she had wanted to borrow".

However, when questioned as to why their experience may have had a paranormal cause, this participant responded as follows:

> Participant 39: “Before I had said ‘ink’ I had said other stationery items (I was making fun and saying random items); I remember saying paperclip, staple, and lead. I could have said other things such as clothing, books or money. Before I said ‘ink’ I had paused as if I’d actually thought about it, rather than it just being part of the random order that I had been saying in jest”.

This response gives an excellent example of the importance of thorough questioning regarding the participant’s whole experience, including their rationalisation of the experience as being paranormal. Contrary to the impression given from the original description of the experience, and despite the participant’s argument for a paranormal cause due to their short pause before stating the correct item, it appears as if the apparently paranormally-acquired information was the product of a series of high-probability guesses.

Finally, in the previous section an example was given of a participant who experienced a hallucinatory impression of her grieving friend. This experience at first appeared to be one of the more compelling cases, due to the vivid, unusual and unexpected nature of the experience, the unexpected nature of the event, and the clear correspondence in time between the experience and the event; the percipient also seemingly demonstrated conviction in her experience by immediately telephoning her friend. However, upon being asked to consider a non-paranormal explanation, the participant reported the following:

Participant 30: “My best friend was on my mind a lot, so I could have just been thinking about her so much that I thought I saw her”.

This remains an intriguing case, even if only for the possibility that the percipient created her own hallucinatory experience, a scenario that was suggested by West (1948b: 282) regarding cases relating to death. One could potentially argue that her thoughts about her friend were also due to ESP; however, it is plausible that her thoughts were due to knowledge that her friend’s uncle was seriously ill, a fact that is not totally clear from the participant’s responses. Nevertheless, this is another example illustrating that participants may tend to focus on points that favour a paranormal interpretation, an issue that was identified by West (1948b: 279).

3.4. General Discussion

3.4.1. Summary and Interpretation of Findings

The aim of this study was to obtain a collection of contemporary reports of ostensibly extrasensory experiences, using a similar approach to Rhine (1951: 165-166) in terms of collecting non-authenticated cases, and examining the characteristics of the cases in the same manner as Schouten (1979, 1981, 1982, 1983). However, a further aim was to take a more critical approach than that of these authors, in order to better understand participants’ interpretations of their experiences and examine in more depth the reasons for participants’ attributions of their experiences to a paranormal cause. This was based on work by Milton (1992), whose study included only 22 participants who were largely from the SPR and Scottish SPR, and who reported

various types of paranormal experience; the present study therefore aimed to replicate Milton's study with a larger, more representative sample, and focus entirely on ESP experiences.

Despite the different eras and samples from which they were taken, there were a number of similarities between the 94 cases in this collection and those of *Phantasms*, the Sannwald collection and the Rhine collection, as follows: A majority of percipients were females; in cases without a target person, the bias towards female percipients was less pronounced; a majority of cases involved individuals who were emotionally or biologically close; dreams were most prevalent, followed by intuitions, then hallucinations; intuitions predominated in GESP cases, while dreams predominated in cases of precognition; negative events were predominant; serious events were less common in cases relating to the self; the target person was identified more often than the event; dreams were the form most associated with identification of the event; and conviction was most common in intuitions, and least common in dreams. There were also some differences between the present collection and the older collections: there were more female target persons than males; more family relationships were involved that were not confined to close family members (spouses, parents, children and siblings); serious illnesses and accidents were the most prevalent events rather than deaths; there were a similar proportion of trivial events in cases with and without a target person; and finally, identification of the target person was similar across the forms of experience, rather than being most common in hallucinations. However, most of these differences were not large departures from the patterns found in earlier collections; overall, the ESP experiences collected from this contemporary sample would appear to be very similar to those collected from Britain

in the Victorian era (Schouten 1979), Germany in the early-to-mid twentieth century (Schouten 1981) and the USA in a similar period (Schouten 1982).

This similarity across time, geographical and cultural boundaries suggests that some form of relatively fundamental process is occurring; however, it is not possible from spontaneous cases alone to demonstrate that this process is a paranormal one. In fact, the theories of many parapsychologists, following Tyrrell's (1946: 72) ideas, very much emphasise the operation of psychological processes in the experiential phase, or stage 2, of psi, in comparison to the parapsychological processes ostensibly involved in stage 1, where the psi information becomes accessible to the individual. Rhine (1978: 23, 28) proposed that the percipient acquires correct and complete psi information, and that errors and omissions occur during the different unconscious mental processes that produce the different forms of experience. In contrast, Schouten (1983: 337) proposed that only the essential information regarding the target person and event is obtained by the percipient, and their experience is produced through their own "creative activity", thereby potentially including fantasised details based on expectation. Similarly, theories such as that of Roll (1966, 1987) and Irwin (1979 cited in Edge *et al*. 1986: 192) propose that the experience is created from activated memory traces, while Stevens (2002) refers to the experience being created by imagination relating to the target. These theories therefore differ regarding what is available to the percipient following stage 1, but all of them suggest that the experiential aspect of psi is created from familiar psychological mechanisms; it is therefore difficult for spontaneous case reports to provide support for any particular theory over another, since examination of the features of the experiential stage cannot by itself differentiate a psi experience from a non-psi experience. It is clear that in all

of the cases in this collection an experience and an event coincided to some extent, but it is impossible to determine whether the experience was in some way instigated by the event.

While spontaneous case accounts cannot demonstrate evidence of ESP even in the most compelling cases, the close examination of many cases in this collection suggested that few were especially persuasive. For the purpose of this study, a case was broadly defined as 'good' or 'compelling' if it involved a vivid, detailed and unusual or unexpected experience that had a clear temporal correspondence with an unusual or unexpected event. Only two cases were identified that largely matched this description, both of which were somewhat lacking in terms of the details included in the experience and therefore did not satisfy all of the 'good' or 'compelling' criteria. This low proportion of good cases may be partly due to the relatively relaxed case acceptance requirements, but it is also in line with the findings of West (1948b: 290) regarding the authenticated cases collected by the early members of the SPR. Of particular interest were the cases that seemed promising from their initial description, but became less so upon more in-depth questioning; for example, subsequent questioning for one of the 'good' cases revealed that the event may not have been as unexpected as was implied in the participant's initial description of the case. This does provide some evidence for West's (1948b: 279) suggestion of a tendency for participants to give more detail on points favouring their paranormal interpretation, while intentionally or unintentionally omitting details that do not fit with this interpretation. It is plausible that many other accounts from published case collections, particularly those where the cases were not authenticated (e.g. those of Rhine), may have similar issues that were not detected. This illustrates another key

reason why spontaneous cases cannot be used as evidence for ESP, and why extensive theorisation based on such cases, of the type engaged in by Rhine (1978) and Schouten (1979, 1981, 1982, 1983), is perhaps risky.

The lack of high-quality cases is not a disadvantage of the study. The aim of this thesis is to combine spontaneous case research with laboratory research to examine whether, together, they point to the operation of parapsychological or purely psychological processes in the occurrence of ostensibly extrasensory experiences. Although spontaneous cases cannot demonstrate evidence of ESP, if the collection contained numerous cases of exceptional quality one could argue that they point towards the operation of a paranormal process that requires confirmation through laboratory testing. Conversely, with few compelling cases it would appear that such experiences are more likely to depend on purely psychological processes; again, though, confirmatory laboratory testing is desirable. In either scenario, the study meets the overall thesis aims.

Given the lack of high quality cases, the most intriguing aspect regarding the current collection relates to the fact that the majority of participants favoured a paranormal interpretation. That participants favoured such an interpretation is not in itself surprising, given that they were recruited based on having an experience defined as paranormal, but this interpretation was favoured even in some cases that were extremely weak evidentially. West (1948b: 299) argued that while the best cases do appear to merit a paranormal interpretation, the same non-paranormal processes may be operating as in the poorer cases. For example, if, as is apparent in this study, there is a general tendency for individuals to find coincidences compelling even when they

are relatively predictable, it is probable that they will be considerably more compelling when they occur in less likely scenarios. Therefore, the study of weaker cases may be of considerable benefit to the study of those that are ostensibly of more evidential value.

Part of the remit of Schouten's (1983: 327) "pragmatic approach" was to ask why individuals single out one, or a few, of their experiences as paranormal. Based on the findings relating to ESP experiences specifically, it would appear that many of these individuals have an experience in which a coincidence occurs between an ordinary experience, such as a dream, and an event. In many cases the details of the event do not need to be exact, and in some cases the identity of the person, or the event, or both, also do not need to be present. In addition, the event itself does not need to be especially serious or striking, although this may make the case more compelling in some instances. Following the ostensible confirmation of the experience, individuals must try to make sense of it. Despite the fact that plausible normal explanations are available for any case, no matter how striking, a sizable minority of individuals are simply unable or unwilling to consider one; they must then either consider their experience as 'unexplained' or make a paranormal attribution. A majority of individuals are aware of potential normal explanations but consider their experience to be beyond these; for example, many individuals appear to consider their experiences as too compelling to be coincidences, despite the fact that coincidences are compelling by nature. Again, with no apparently plausible normal explanations, a paranormal attribution is the only option other than leaving the experience unexplained. The tendency for individuals to confide in sympathetic others may also mean that their experiences and accounts are not satisfactorily critiqued, leading to

consolidation of the paranormal interpretation. When subsequently recounting their experience, participants may then tend to focus on points that favour this interpretation; this then has the potential to lead to issues such as unintentional exaggeration (West 1948b: 265) and distortions of memory (West 1948b: 279), although these issues could not be specifically observed in the present study. Such exaggeration and distortions may lead to memory errors regarding the clarity, detail and vividness of the experience, lending it a somewhat 'hallowed' status and cementing its position as an intriguingly unique experience. This description is clearly a generalisation and will not apply to all aspects of all accounts, but based on the overall findings within this study and the work of other researchers it would appear to represent the 'average' ESP-type experience. However, this does not necessarily rule out the operation of a genuinely paranormal process in some accounts.

3.4.2. Limitations

Despite the efforts made to advertise the study to a wide audience, the number of non-student responses was disappointing, as was the necessity to remove approximately one-third of the submitted cases, due to unsuitable content. However, the remaining cases provided a large amount of good quality data, and the collection was considerably larger than the 23 cases included in Milton's (1992) study, of which only 7 related to ESP. The length of the questionnaire may have been prohibitive without any tangible reward for non-student participants; this issue also seems to have been a consideration for Milton (1992: 315), who specifically obtained participants from the SPR and Scottish SPR who she deemed would be more willing to complete a lengthy questionnaire. The samples of neither study are therefore typical of the general

population; Milton's participants were members of societies with an academic interest in ostensibly paranormal phenomena, while the participants in the present study were largely undergraduate psychology students who responded to an advertisement requesting reports of ostensibly paranormal experiences. This may cause issues with generalisation of the findings; for example, both samples may be relatively high in intelligence in comparison to the general population. However, it is likely that the present study obtained mostly participants who were not familiar with parapsychological research and would therefore be more likely to represent a lay-knowledge of the topic than the participants in Milton's research. Furthermore, analyses suggested that the student respondents had not had a large effect on the overall results; the non-student participants contained a slightly higher proportion of females than the students, despite the latter being sampled from a female-biased population, and there were no significant differences between the types of events reported by the two groups. In addition, although one may expect psychology students to be familiar with various psychological factors such as reasoning biases, memory errors and the tendency to interpret chance coincidences as meaningful, these participants were not immune from submitting cases that were relatively weak evidentially. Nevertheless, a more generalisable sample would be desirable.

The non-authenticated nature of the cases is also a limitation, since confirmation was not gained from witnesses or other sources as to the veracity of the accounts, meaning that the reports may contain inaccuracies or fabrications; however, this was also true for the collections of Rhine and Sannwald. In defence of this method of obtaining reports, Schouten (1979: 445-450) conducted analyses suggesting that the better-corroborated cases in *Phantasms* did not differ significantly from the other cases in

that collection, and considered it very unlikely that the observed patterns and relationships would be found if large numbers of contributors were independently fabricating their accounts (Schouten 1979: 451); West (1948b: 274-277) also argued that relatively few accounts appeared to be pure lies. It is additionally worthy of note that, despite the potential for inaccuracies, exaggerations and fabrications to improve the apparent impressiveness of the cases, comparatively few were especially compelling, suggesting that participants had not artificially enhanced the apparent quality of their experiences.

One final potential limitation of the study relates to the fact that participants were not required to believe that their experience was of a paranormal or extrasensory origin. This was intended to allow more focus on understanding participants' interpretations of their experiences, but could possibly have caused issues with validity and internal reliability since this potentially permitted the inclusion of low-quality cases and inconsistency in the attitudes of the respondents towards their experiences. However, only 7 participants stated either that they had concluded their experience was not paranormal, or that they were unsure as to the cause of their experience, so this would appear not to have had a large effect on the overall findings.

3.4.3. Future Research Directions

This study has provided a number of intriguing results and provides numerous possibilities for further research, including an examination of whether the present findings can be replicated. To improve reliability and validity, it may be necessary to more specifically request participants who have concluded that their experience has a

paranormal cause; this will ensure that there is greater consistency across the cases and that the cases are all valid in terms of being experiences that have been interpreted as paranormal, irrespective of their evidential qualities. Larger and more representative samples are also required to allow generalisation of results.

Validity of cases may be further improved by attempting authentication processes of the kind conducted by the early SPR members, such as the authors of *Phantasms* (Gurney *et al*. 1886a, 1886b); although this will not allow the cases to be used as evidence of ESP, it will at least allow fabrications or gross exaggerations to be excluded and ensure that cases are as high-quality as possible. However, as noted by J. B. Rhine (1948b: 232), authentication is a lengthy process that has the potential to exclude a large amount of case data; furthermore, as mentioned earlier, well-authenticated cases do not appear to be noticeably different from cases that have not been corroborated (Schouten 1979: 445-450). Nevertheless, if researchers wish to take a more in-depth case study approach, the authentication process may allow additional aspects to be examined. For example, it will be necessary to utilise interview methods to thoroughly discuss the case with the percipient and any target persons, witnesses or confidants. In addition to clarifying the details of the experience and event, these interviews can be used to gain further insights into the ways in which all of the involved individuals attempt to rationalise and make sense of ostensibly paranormal experiences. This would allow further questioning on pertinent aspects such as why some participants interpret experiences as paranormal due to their uniqueness, while others interpret them as paranormal due to their regularity. The various potential normal explanations could also be explored, with participants questioned as to their reasoning for why the experience could not be explained by coincidence, sensory

leakage etc. By interviewing all of the individuals involved in the experience, it may be possible to demonstrate how and why discrepancies arise in their accounts. In addition, if a case is reported shortly after it occurs, there is potential to conduct repeated interviews across a specific time span to examine changes in attitudes to the experience, as well as to assess the possibility of exaggeration or memory distortions altering the details reported by the participants. However, it must be considered that the type of participants who are willing to volunteer for a series of interviews may be different to those who complete an anonymous online questionnaire. The rather interrogative approach suggested here may also be unpalatable to participants with strong paranormal beliefs.

In recent years, some researchers, such as Robin Wooffitt, have turned to qualitative approaches for their analysis of data; this allows examination of not only what has been reported, but how it has been reported. For example, Wooffitt (1988) used a discourse analytic approach and identified a number of features in a single participant's verbal report of repeatedly hearing music, with no apparent source, by her window. Some of these features seemed to have the function of the participant presenting herself as an 'ordinary' person; for example, she described the music in a positive manner, which suggested she was not overly prone to interpreting unusual occurrences in a paranormal or supernatural manner (Wooffitt 1988: 144). Her account also included instances of exaggeration; for example, she described how she "tore apart" the window and "did everything" to try to locate the source of the sound, seemingly in an attempt to emphasise the thoroughness of her search for a physical cause of the noise (Wooffitt 1988: 144-145). Although only a single case, this demonstrates, similarly to the findings of the present study, that percipients do not

report their experiences in a dispassionate and neutral manner, but will do so persuasively. There is potential to use other qualitative approaches in the study of extrasensory experiences; for example, interpretative phenomenological analysis (IPA) is defined by Smith, Flowers and Larkin (2009: 1) as "a qualitative research approach committed to the examination of how people make sense of their major life experiences". Given that some extrasensory experiences do appear to have considerable effects on the lives of experients, this may be a promising approach; indeed, this analytic technique has recently been applied in studies of out-of-body experiences (Wilde & Murray 2008) and mental mediumship (Roxburgh 2011).

3.4.4. Using Spontaneous Cases in Laboratory Research

Although there is much room for further research in the area of spontaneous cases, the present thesis aims to examine ostensible ESP both in spontaneous cases and in laboratory conditions, using the features of the former to provide suggestions for the latter. While this study has demonstrated considerable evidence that many participants have failed to consider plausible normal explanations for their experiences, a small number of cases remain at least suggestive of the operation of an anomalous process; furthermore, a single study of spontaneous cases is insufficient to negate the large amount of experimental research, such as that using the ganzfeld environment introduced in Chapter 1, that has suggested the existence of ESP (e.g. Palmer 2003).

One of the most consistent findings obtained by Schouten (1979: 420, 1981: 22, 1982: 126) was the tendency for spontaneous telepathic experiences to occur between people who were emotionally or biologically close. Schouten also consistently found

that percipients were predominantly females (Schouten 1979: 414, Schouten 1981: 17, Schouten 1982: 121) and target persons were predominantly males (Schouten 1979: 417, Schouten 1981: 20, Schouten 1982: 124), but he argued that the relationship between the two individuals appeared to be more important in determining the occurrence of an ESP experience, rather than their sexes per se (Schouten 1983: 332). The present study also found a predominance of close relationships and female percipients, but found a predominance of female rather than male target persons; this would appear to support Schouten's suggestion that the relationship is the most important aspect. Thus, if Schouten's theorisation is correct, one would expect that more closely bonded pairings would perform better in laboratory GESP tasks than strangers or less closely bonded pairings, while the sexes of the two participants would have no effect. The consistency of the apparent importance of closeness of bond in spontaneous cases would suggest that, if this represents a genuine ESP effect, it would be relatively simple to replicate in the laboratory; the closeness and sexes of the pairings are also straightforward variables to manipulate. In preparation for the report of a study examining these variables, the next chapter presents a detailed review of laboratory research examining the effect of sender-receiver relationship and sex pairing in ESP tasks.

Chapter 4

The Sender-Receiver Relationship, Sex Pairing and ESP Task Success: A Review of the Literature

4.1. Introduction

The previous two chapters have demonstrated that, in spontaneous cases of ostensible ESP that involve the percipient having an experience relating to an agent, or target person, the individuals usually have a close relationship; this may be emotional, biological, or both. In *Phantasms of the Living*, the Sannwald collection and the Rhine collection, the proportion of experiences involving close family members was highest (51.6 to 65.4%), followed by friends and acquaintances (20.4 to 32.8%), and other family members (11.0 to 13.4%), with very few experiences involving strangers (1.6 to 5.1%; Schouten 1979: 420, Schouten 1981: 22, Schouten 1982: 126). The results of the study presented in Chapter 3 did not follow this pattern, with the 'other family' category being most prevalent, but it is clear that participants' relationships with these family members were close nonetheless.

One would expect that the likelihood of detecting a case should be higher for individuals who know each other better and are in contact more often; Rhine (1956: 20) observed instances of apparent telepathy between strangers, confirmed during a brief conversation between the two individuals involved, and speculated that such experiences could easily occur without confirmation if the individuals do not meet. From Schouten's (1979: 420, 1981: 22, 1982: 126) findings the relative proportions of

cases reported in each relationship category would appear to match what is presumably a common situation in most individuals' lives; one spends one's time mostly with close family members, followed by friends and acquaintances, then with other family members, and finally strangers. It is plausible that the difference in the findings in the study reported in the previous chapter was due to the relatively young age of many of the participants, who may have been more likely to spend time with other family members such as cousins and grandparents. This result would thus appear to be easily explainable, but, as discussed in Chapter 2, Schouten (1979, 1981, 1982) performed a series of analyses that suggested otherwise; he thus proposed that the relationship between two people determines the probability of an ESP experience occurring, with the probability of becoming the percipient higher for the person who is more emotionally dependent on the other (Schouten 1983: 332). This would seem to corroborate Barrett, Gurney and Myers' (1882: 29) early suggestion of the importance of "consanguinity and familiarity" in telepathy.

Spontaneous case studies have also found consistent patterns in terms of the sex of the percipient and target person. The majority of percipients are females, although the exact proportion appears to vary; Schouten (1979: 414, 1981: 17, 1982: 121) found this to be 56.2% in *Phantasms*, 74.3% in the Sannwald collection, and 83.3% in the Rhine collection, while the study reported in Chapter 3 found the figure to be 84.0%. The high Rhine figure appeared to be partly due to a reporting effect, where females appeared more inclined to report cases than males (Schouten 1982: 121), and the study in the previous chapter also sampled largely from a predominantly female population, but it would seem that this female bias is present nonetheless.

In previous collections the majority of target persons were male, with a much more similar proportion across collections than the percipients; Schouten identified proportions of 64.6% in *Phantasms*, 69.1% in the Sannwald collection and 64.2% in the Rhine collection (Schouten 1979: 417, Schouten 1981: 20, Schouten 1982: 124). In the Rhine collection males were more likely to be involved in serious events than females, but this was a weak association and so Schouten (1982: 125) did not consider it likely to explain the consistently greater proportion of male target persons. The study reported in Chapter 3 did not follow this pattern, with a slightly larger proportion of female target persons than males; if Schouten's (1979: 426) explanation regarding emotional dependence on the target person is correct, this result may be explained by a shift towards more equal emotional dependence on the two sexes.

Schouten's analyses found these proportions of males and females to be relatively constant across different close family pairings (spouses, parent/child and siblings); however, when children had an experience relating to one of their parents, the target person was slightly more often the mother than the father (Schouten 1979: 417-418, Schouten 1981: 20-21, Schouten 1982: 124-125). For these pairings the percipient distribution was also less female-biased; for *Phantasms*, there was a slightly larger proportion of sons as percipient than daughters (Schouten 1979: 423-424, Schouten 1981: 24, Schouten 1982: 129). Several other results are also enlightening; for example, in cases with no target person, such as precognitive experiences relating to the self, the number of male and female percipients was more balanced (Schouten 1983: 332); this result was also found in the study reported in Chapter 3. Furthermore, females' experiences do not cover larger distances than males', nor do they contain more details (Schouten 1983: 330). This further suggested to Schouten (1983: 330-

331) that the sexes do not differ in their ESP ability, and that the differing proportions of male and female percipients and target persons reflected his ideas regarding the importance of the relationship in determining the percipient and target person (Schouten 1983: 332).

As with Rhine (1978), Schouten used his findings to make suggestions regarding the ESP process. However, as discussed in Chapters 2 and 3, spontaneous cases cannot be used as evidence of ESP, and since one cannot be sure that ESP has occurred, one must be wary of over-interpreting specific aspects of the cases. As mentioned earlier, Schouten conducted a number of analyses that appeared to demonstrate that it is the relationship between two people that determines the probability of an ESP experience occurring; for example, even though one is presumably equally likely to hear of the death of a close family member, other family member, or friend, the target person is still more often a close family member in death cases (Schouten 1979: 420-421, Schouten 1981: 22, Schouten 1982: 126). However, whilst one may be more likely to have an experience relating to a close family member, this does not necessarily indicate ESP is involved; for example, one may be more likely to dream or worry about closer relations, increasing the chance that a dream or worry will coincide with a corresponding event.

This thesis aims to attain a full appreciation of the factors involved in ostensibly extrasensory experiences, and to examine whether these factors are parapsychological or purely psychological, by studying ostensible ESP in spontaneous cases and in laboratory conditions. Having identified a highly consistent result in spontaneous cases, a logical next step is to thoroughly examine laboratory research that has tested a

related hypothesis; if a similar result is found in laboratory studies, this may point more strongly to a parapsychological cause of ESP experiences. This situation is therefore exactly as J. B. Rhine (1948: 232-233) proposed; spontaneous cases cannot provide evidence for ESP, but examination of their recurring characteristics has presented suggestions for experiments. Based on Schouten's observations, closer pairings of participants would be expected to perform better in telepathy or GESP tasks than less-close pairings, particularly when the individual who is more emotionally dependent acts as the 'receiver'. In addition, the sexes of the participants would be expected to have no bearing on the results, when controlling for participant closeness. This chapter reviews relevant research to examine if these hypotheses have been supported.

4.2. The Sender-Receiver Relationship

4.2.1. Selected Close Relationships

A few studies have selected participants with a specific close relationship, but have not compared them with other types of pairings; while this choice has clearly been made in an attempt to improve task success, it has the disadvantage of rendering it unclear whether the closeness of the relationship has actually affected scoring. Beloff (1969) tested the hypothesis that being in love would affect ESP scoring, and examined 20 couples who were either engaged, newly married or "going steady" (Beloff 1969: 1). A forced-choice paradigm was used with five images of faces as targets, one of which was the face of the receiver; this was included as an additional test of whether there may have been a differential scoring effect with respect to the

use of the receiver's own face in comparison to those of strangers. Each participant acted as receiver for 5 runs of 25 guesses; on one of these the sender did not view the targets, as a control condition. Only a single room was available for the study, so the researcher attempted to reduce the possibility of sensory leakage by placing the sender's and receiver's consoles as far apart as possible with a screen between them, and requiring the receiver to wear headphones emitting a constant tone. However, conversation with the receiver was still possible, so sensory leakage could not be fully eliminated; clearly the use of two separate rooms would have been desirable. Despite this issue, overall scoring was non-significantly below mean chance expectation (MCE). Runs with senders scored below MCE, while runs without senders scored above MCE, but this difference was not significant. This type of comparison, comparing General ESP (GESP) with clairvoyance, will be discussed in more detail later in the chapter.

Brinkman and Van Hilten (1972) tested husband-and-wife pairs (the number is not stated in the brief abstract of this Dutch-language report). Targets were audio recordings with neutral, positive or negative emotional tone. Thirty calls were made for each pair, consisting of 10 in which the receiver guessed the emotional tone and 20 in which the receiver guessed which of two recordings was the target. The location of the study is reported as a "family dwelling" (Brinkman & Van Hilten 1972: 179); no additional details are provided, but this suggests the setup may not have been as well-controlled as in a laboratory. However, results were not significant.

Studies have also used physiological measures in an attempt to examine unconscious aspects of ESP, in a similar manner to the research using EEG and fMRI that was

introduced in Chapter 1. Rice *et al.* (1966) conducted a study with daughters as senders and mothers as receivers, to examine "ESP transmission of an intense emotion" (Rice *et al*. 1966: 282). Galvanic skin response (GSR) deviations were recorded for the receivers, while some of the senders experienced a blank cartridge being fired in their presence; as a control, some of the senders did not experience this. The experimental group showed significantly higher GSR readings than the control group. In a second study, husbands were senders with their wives as receivers. Experimental senders experienced the immersion of their feet in ice water, while the control senders did not. GSR readings were again recorded for receivers, with the experimental group showing significantly higher GSR deflections than the control group. Given that past research, and the study reported in Chapter 3, identified spontaneous cases of ESP that have a purely emotional component (e.g. Rhine 1953a: 88) or involve bodily sensations (e.g. Rhine 1953a: 93-95), the attempt to assess this in a laboratory study is laudable. Furthermore, the use of a scenario specifically designed to induce an intense emotional response corresponds well with the many strongly emotional events that are involved in spontaneous cases, such as deaths and serious accidents (e.g. Schouten 1979: 432, Schouten 1981: 29, Schouten 1982: 133). The findings of increased GSR readings in the experimental groups would thus suggest that the receivers demonstrated a physiological response resembling that of an emotional reaction, in response to the stimulus applied to the senders. The increased objectivity of physiological measurement would seem to provide more compelling evidence of ESP than the apparent 'guesswork' involved in making conscious responses; however, the short report of these studies does not state the numbers of participants, nor does it give detail on the analysis of the GSR readings, rendering the quality of the findings unclear. In addition, the researchers state that the blank

cartridge was fired "presumably out of hearing of the percipients" (Rice *et al*. 1966: 282); this rather tentative statement suggests that sensory leakage was a possibility in this study.

4.2.2. Twins

The idea of a telepathic connection between identical (monozygotic, MZ) twins is widespread (Lyon Playfair 1999: 86); a survey conducted by Brusewitz and Parker (2013) found that approximately 60% of twins reported "exceptional experiences", with approximately 11% reporting telepathic experiences to be a frequent occurrence in their life. A number of studies have therefore attempted to test whether pairs of twins perform well at ESP tasks.

Rogers (1960) tested six pairs of MZ twins, consisting of five pairs of college students and one pair of nursing students, in a forced-choice GESP Zener card study. The results were not significant over 594 total runs, although the pair of nursing students did obtain a hit-rate that was significantly above MCE in their 80 runs. However, the study report consists of a very short abstract of an unpublished manuscript, meaning the quality of the methodology is unclear.

Nash and Buzby (1965) tested 11 pairs of MZ twins and 14 pairs of non-identical (dizygotic, DZ) twins (9 pairs of whom were the same sex), aged between 5 and 13 years old, in a forced-choice test of clairvoyance using Zener cards. In the first three runs of a session the twins' mother held the cards while both twins, separated by an opaque partition, acted as receivers. In the final six runs the twins alternated roles as

card-holder and receiver; therefore each twin acted as receiver for six runs in total. Overall results were non-significant, but it was found that the MZ twins were significantly more likely to have scores with the same algebraic sign (i.e. both twins scoring above MCE, or both scoring below) than were DZ twins. However, similar scoring in the first three runs may indicate concordance in calling tendencies rather than ESP; furthermore, the twins were separated only by an opaque partition, allowing the possibility of subtle auditory communication. A finding of more similar scoring for MZ than DZ twins over the final six runs may, as Nash and Buzby (1965: 54) suggest, be indicative of a genetic basis for ESP ability; unfortunately the researchers do not seem aware of the possibility of call concordance, and no comparison is provided of the two types of runs.

Medhurst (1968) reports on a short television test of GESP using 85 pairs of MZ twins. These were seated in the audience and separated into two groups, with one twin in each group. A curtain was drawn across to separate the groups, but there remained opportunity for sensory leakage and for the receiving participants to influence each other's calls. In the first trial one twin randomly selected a playing card for their whole group to send to the other group. Only two of the receiving group correctly guessed the card, where MCE was 1.6. The second trial used cards similar to Zener cards, but with the cross and star replaced with a triangle and two parallel lines. The group roles were swapped, with one twin again randomly selecting a card for their whole group to send to the other. Only 66 of the receiving group made a guess at the target, and of these 16 were correct, only slightly above MCE of 13.2. Thus, no evidence of ESP was obtained.

Robichon (1989 cited in Lyon Playfair 1999: 90-91) tested a single pair of male MZ twins, using Zener cards with each symbol also assigned a different colour. An unconventional target selection method was used; the sender shuffled the pack of cards, selected a card, viewed it, replaced it, then shuffled the cards again, selected another, and so on, until 25 cards had been viewed. For the first four runs the participants could see each other over a low curtain, offering a clear opportunity for sensory leakage or cheating, but scoring was non-significantly above MCE. For the next six runs the participants were isolated from each other and the receiver was given a set of symbols to view, which apparently helped him to better identify the target; scoring in these runs was very highly significant, with a mean hit-rate of 80.66%, compared to MCE of 20%, and a best score of 23 hits from 25 cards. A final run was performed with no set of symbols for the receiver to view, and a score of 19 hits (76% hit-rate) was achieved. Lyon Playfair (1999: 91) notes that "there may be those who feel that such an irregularity [in the method of target selection] invalidates the entire experiment"; indeed, allowing the sender to select the targets introduces the possibility of cheating and, given the usually small effect sizes in parapsychological research, this study was so successful as to arouse suspicion.

Similarly to the study of Rice *et al*. (1966), Esser, Etter and Chamberlain (1967) aimed to assess changes in the autonomic nervous system in response to emotional stimuli, by using a plethysmograph to detect changes in blood volume. Targets were words, sentences, quotes and names that were chosen to have specific personal meaning and emotional impact on each of the participants; control targets were also employed that were not expected to have these effects. The rooms containing the participants were well-separated by the experimenter's control room, which appeared

to satisfactorily preclude sensory leakage. Each session lasted for approximately 15 to 20 minutes, throughout which time plethysmograph readings were recorded from the receiver's finger. During this period, on 12 occasions a random stimulus generator triggered a slide projector to display a target to the sender on a screen, for 20 seconds. Plethysmograph traces were subsequently blindly judged for reactions, defined as large changes in the gradient of the trace, and it was examined whether any of these reactions began in the 20-second periods during which the targets were displayed. The researchers hypothesised that more reactions would coincide with the meaningful targets than with the control targets. Six pairings were tested in total, including one pair of MZ twins and two pairs of DZ twins; each pair took part in two sessions, alternating the sender and receiver. For the MZ twins, and for one pair of DZ twins, one session supported the researchers' hypothesis, while no reactions occurred in the other. For the second pair of DZ twins, one session provided results in the opposite direction to the researchers' hypothesis, while in the other session an equal number of reactions coincided with meaningful and control targets. Of the remaining 6 sessions from non-twin participants, 5 sessions supported the researchers' hypothesis (giving a total of 7 in the 12 sessions), and 1 session produced no reactions. The researchers argue that these results "suggest the existence of subject reactions to [an] agent's perception of significant targets" (Esser *et al*. 1967: 55), but this is not especially persuasive, particularly as no inferential statistics are presented to support this claim.

Barron and Mordkoff (1968) tested nine pairs of female MZ twins. Both members of each pair had their skin resistance, heart rate and respiration measured throughout the trials. For the first five pairs, the sender viewed a film that had been demonstrated to have "pronounced arousal value" (Barron & Mordkoff 1968: 76), while the receiver

relaxed in a darkened room; in addition to the physiological measures the receiver's verbal mentation report was recorded. The participants then swapped roles, with the new receiver told that a different film would be viewed, although the same film was actually shown. Four of these five pairs showed no coincidences on the physiological measures or the mentation report. In one pair, neither participant provided a verbal report but both twins showed arousal within sixty seconds of arousal occurring in the sender; this occurred once for one twin and twice for the other, from four arousal points present in the film. The researchers regarded this as promising but conceded that they could not evaluate the probability of this occurring by chance (Barron & Mordkoff 1968: 77); given this point, the utility of the study in demonstrating ESP is questionable. For the fifth pair, in addition to the film, the sender responded to a set of Thematic Apperception Test (TAT) cards, while the receiver made up a story in the absence of pictures. The TAT was also used for the remaining four pairs, who were not shown the film as it seemed to be "rather traumatizing" for the participants who had viewed it (Barron & Mordkoff 1968: 78). Coincidences were noted for all pairs, but it became apparent that these were due to concordance of thoughts relating to shared experiences, recent events, current worries etc. No physiological coincidences were evident for these four pairs.

Other physiological studies have used electroencephalogram (EEG) measures. Duane and Behrendt (1965) tested 15 pairs of MZ twins and examined whether the eye closure of one twin, and the concomitant elicitation of alpha rhythms (8-13Hz) in the participant's EEG, would be associated with increased alpha rhythms in the other twin. The procedure was also carried out with unrelated participants, paired with each other and with one of the twins, as a control, although it is not stated how many of

these control trials were performed. Two of the 15 twin pairs did show apparent extrasensory induction of alpha rhythms, while none of the unrelated pairs did so; however, analysis of the EEG traces was by inspection only, and the single-page report has been criticised for lacking in detail, rigour and adequate controls (Charman 2006: 5); for example, it is unclear whether the eyes-closed periods were randomly determined or whether they could have been anticipated by the receiver. Blackmore and Chamberlain (1993: 89) further criticise the report for not describing baseline alpha rates.

Dean (1966) attempted a similar study to Duane and Behrendt (1965), with 24 pairs of twins, 10 of which were MZ pairs. EEG was recorded from the receiver only, with average percentage of alpha rhythms compared between the sender's eyes-open and eyes-closed periods. The measurement of only the receiver's EEG did not allow a direct comparison of EEG traces as in Duane and Behrendt's (1965) study, but the use of a quantitative measure of success is a clear improvement; however, no differences in the receiver's alpha percentage were found between the sender's eyes-open and eyes-closed periods.

Charlesworth (1975) devised a free-response paradigm involving a tape recording of relaxation and guided imagery exercises, accompanied by environmental sounds, to induce an imaginary dream in receivers. At specific points in the tape it was suggested to the receiver that they would see something unusual or out of place in the current scene. At these points the sender, who was listening to the same tape, was asked to incorporate the randomly-selected target picture into their imagery and attempt to actively 'send' it to the receiver; the receiver was simply asked to let their imagination

flow and see what appeared. Following the trial the receiver ranked their imagery against six pictures, one of which was the target. A first experiment demonstrated that this technique produced significant binary hitting (ranking the target from 1 to 3 inclusive), in comparison to a control group who did not undergo the guided imagery aspect, who scored at MCE. The experiment was then repeated using 10 pairs of MZ twins (7 female and 3 male) and 10 pairs of same-sex DZ twins (5 female and 5 male); each pair took part in two trials, with sender and receiver swapping for the second trial. The MZ twins scored non-significantly below MCE, while the DZ twins scored significantly above MCE; the difference between the groups was significant. However, a confounding variable was identified, in that the DZ twins were significantly more extraverted than the MZ twins. As an alternative explanation, Charlesworth (1975: 89) proposed that the poor performance of the MZ twins may have been due to "an immense need to individualize" leading them to "shut off psychic encroachment from each other". While this interpretation is rather speculative and needs confirmation, overall this is a well-controlled study that uses an original experimental paradigm.

Also using free-response methodology, Parker (2010) conducted ganzfeld research using 14 pairs of MZ twins (4 male and 10 female) who had been selected based on their belief in and experience of ESP, as well as their experiencing of other aspects that were suggestive of a connection between them, including a feeling of a "basic connectedness", similar dreams and commonality of thoughts (Parker 2010: 123). Although this participant selection method was commendably rigorous and included selecting participants based on their spontaneous experiences of ostensible ESP, it had an adverse effect on the sample size; ten hits were obtained from 28 trials using video

clips as targets, giving an above-MCE hit-rate of 36%, but this was not significant due to the small size of the sample.

If claims of psychic experiences between twins are not due to ESP, they may be due to *thought concordance*; twins may think similarly and make similar choices when provided with a set of alternatives, either due to genetic similarity or common upbringing (Blackmore & Chamberlain 1993: 89). As discussed earlier, this possibility was appreciated by Barron and Mordkoff (1968: 78), who noted the tendency for their participants to provide similar responses due to shared experiences, recent events and current worries; the possibility of concordance in target calls may also have explained the finding in Nash and Buzby's (1965) study, where MZ twins scored more similarly than DZ twins. However, Nash and Buzby (1965) did not appear to be aware of this issue, and a similar error was made by Kubis and Rouke (1937). These researchers tested six pairs of twins (one MZ and five DZ) in a forced-choice Zener card study, where an experimenter acted as sender whilst the twins, in separate rooms, simultaneously acted as receivers. Unknown to the participants, their calls were compared with each other in what the authors referred to as a test of "pure telepathy" (Kubis & Rouke 1937: 164), but what was in fact a test of concordance; in addition, the study was conducted at participants' homes where controls against sensory leakage were not always fully adequate. However, no significant concordance between twins was found in 1,500 trials with each pair. Two participants did score significantly on guessing the target in subsets of trials, but not across the full set. Some twins also performed more standard trials, with one twin acting as sender and the other as receiver, but no evidence of ESP was obtained.

Similarly, France and Hogan (1973) used an experimenter as sender for 25 Zener card runs, testing 9 sets of MZ twins, 7 sets of DZ twins and 10 sets of siblings. Examination was made of 'like hits', where both members of a pair selected the correct target, and 'like responses', where both members selected the same, incorrect card. There were no differences between the three groups in terms of like hits, but for like responses MZ twins and siblings scored significantly higher than DZ twins. Similarity between the calls of the members of a pairing would again indicate thought concordance rather than ESP; interestingly, the researchers were aware that they were measuring thought concordance but speculated that it may be viewed as a form of spontaneous ESP (France & Hogan 1973: 710). This is a non-falsifiable hypothesis; in addition, the study was problematic due to all participants being in the same room during testing, allowing opportunity for sensory leakage.

Blackmore and Chamberlain (1993) specifically compared thought concordance and ESP conditions, using 3 pairs of MZ twins, 3 pairs of DZ twins and 6 pairs of siblings. Numbers, drawings and pictures were used as targets in different trials. In thought concordance trials the sender could choose the target, whereas in ESP trials it was randomly chosen for them; the receiver did not know which condition was being used. In trials with numbers and pictures the receiver had to detect which was the target, from 1-10 or from a set of four pictures respectively, whereas in drawing trials the receiver had to draw what they thought the target was, and correspondence between the two drawings was assessed by an independent judge. Twins scored significantly more hits than siblings in thought concordance conditions but not in ESP conditions; due to low numbers of participants this analysis was run combining all three types of target, but this pattern was apparent in each of the three individual types. This

suggested to Blackmore and Chamberlain (1993: 95) that thought concordance is responsible for creating coincidences in twins' lives, rather than ESP; however, the researchers did not analyse whether scoring in the ESP trials was significantly above MCE.

4.2.3. Known Senders and Unknown Senders

Some of the previously described studies (e.g. Duane & Behrendt 1965) compared twins to pairings who did not know each other. A number of studies have compared unacquainted participants with other types of more closely bonded pairings. Bleksley (1963) reports an unusual study comprising two experiments with a single receiver, during which the receiver attempted to awaken at a time randomly selected by the researcher, between 0:00 and 7:59am. Due to potential error in setting and reading an analogue clock, an awakening time was considered a hit if it occurred within one minute of the target time. With the full target range of 480 minutes, the probability of gaining a hit was thus 3 in 480, or 1 in 160. The researcher and participant lived in Johannesburg and Cape Town respectively, and had only communicated by letter when they began the study. Experiment 1 consisted of 135 trials, conducted whilst the participant was on a voyage to the Netherlands, including the outward and return journeys. MCE was therefore less than 1, but 3 hits were obtained, consisting of 1 hit on the exact time and 2 hits within one minute. This result was significant, but when broken down into hits on the hour only and hits on the minute only, scoring was rendered non-significant; Bleksley (1963: 7) thus considered that this experiment had not demonstrated significant evidence of ESP. Following the first experiment the researcher and participant met in person, and conducted a second experiment on the

basis that this meeting may lead to better results. Experiment 2 consisted of 149 trials, and 8 hits were obtained, consisting of 3 hits on the exact time and 5 hits within one minute. This was highly significant, and Bleksley (1963: 9) considered this improvement in scoring as potentially due to the "existence of a personal linkage" following the meeting of researcher and participant. The relatively low number of hits may raise questions as to the meaningfulness of the results in terms of a demonstration of ESP, but the researcher was careful to make appropriate statistical corrections to allow for this, in addition to performing checks on the assumed probabilities of hits. This would therefore seem to be a meaningful result, and not due to statistical artefacts or a fortuitous coincidence between target times and common waking times of the participant. However, the researcher concedes that a modified paradigm using a single minute hand may allow a simplified examination of ESP compared to the use of hours and minutes, while the possibility of multiple waking points also needs to be considered (Bleksley 1963: 12). Unfortunately an improved study of this kind does not appear to have been conducted, rendering these findings a curiosity rather than a convincingly replicated demonstration of ESP.

Baker, Jacob and Keil (1977) also conducted a study with a single receiver, a male teenager who was in a meditative state throughout the trials. Forced-choice methodology was employed; the first three experimental series used four geometric configurations as targets, and the following four series used five photographs of the receiver's friends and relatives. Overall scoring was highly significant for both series. Baker, the receiver's sister, was the sender for most trials, but in some series she alternated with another experimenter every 50 trials; scoring was non-significant with this other experimenter as sender. This would appear to suggest an advantage of a

sibling relationship; however, the receiver does not seem to have been blind to the identity of the sender.

Van Busschbach (1955) conducted a forced-choice study with 907 primary school children and 268 secondary school children. Each run consisted of 30 trials; instead of Zener cards, ten trials used arithmetical symbols as targets, ten used colours and ten used words. For most of the participants three runs were conducted with different senders: firstly a teacher, then a researcher (stranger), and finally the highest scoring pupil from these earlier runs. Primary school children scored significantly above MCE, while secondary school children scored non-significantly below MCE; the difference between these two groups was significant. Primary school children scored above MCE for all three sender types, but only significantly so for teachers. Secondary school children scored non-significantly below MCE for stranger and pupil senders, but exactly at MCE for teachers. There were no differences in scoring for the three different target types. Van Busschbach (1955: 79) interpreted these results as partly due to the fact that the teachers of the primary school children were in charge of the class at all times, whereas each secondary school teacher was one of various teachers who would teach the class throughout the day; contact between the receivers and sender was thus more intensive for the primary school children. Given the apparent importance of contact, one may also have expected high scoring with pupil senders, which did not occur. Van Bussbach (1955: 80) explained this by arguing that the relationship between teacher and child contains "an element of readiness for psychical transfer which is pedagogical in character and which forms the core of the pedagogical act", whereas such readiness does not exist between children themselves or between an adult stranger and a child. However, the receivers were not blind to the

identity of the sender, and there does not appear to have been consideration of order effects, since teachers always acted as senders first. Decline effects are a consistent finding in parapsychological research (Nash 1989: 412) and are proposed to reflect boredom or fatigue on behalf of the participants or experimenters (Irwin & Watt 2007: 67); the higher scores for teacher senders may therefore have been due to increased motivation or interest at the beginning of the session. In addition, the classroom testing environment allowed some possibility for sensory leakage and for the receivers to influence each other's calls.

Louwerens (1960) also used a classroom testing situation. She examined 684 young children of four to six-and-a-half years old, using a forced-choice paradigm where the children had to select one of five coloured pictures of toys, with their teacher as sender and the instructions given in the form of a fairytale. Each child took part in one run of 25 guesses. For ten of the fifteen classes (420 participants) the study was repeated one or two days later, with the same children as far as possible but with the researcher as sender. With the teacher as sender the results were significantly above MCE; with the researcher as sender the results were also above MCE, but not significantly so. The study's novel feature of integrating ESP targets into a fairytale scenario is commendable as it appears likely to retain the interest of young children to a greater extent than drier card-based testing; however, similarly to Van Busschbach's (1955) research, receivers were not blind to the identity of the sender, and the classroom testing environment could not fully eliminate the possibility of sensory leakage or the influence of participants on each other's calls. Again, teachers always acted as senders first, meaning that the difference in scoring between the teacher and researcher senders may be due to a decline effect (Palmer 1978: 101).

Rice and Townsend (1962) compared four couples who were married or engaged with four couples who "knew one another slightly, if at all" (Rice & Townsend 1962: 212). Each pair performed eight forced-choice GESP Zener card runs, with the sender and receiver alternating for each run. The 'related' group scored significantly above MCE, while the 'unrelated' group scored significantly below MCE; the difference between the groups was highly significant. The researchers also noted a tendency for better scoring in longer relationships in the related group, while a similar result was identified in the unrelated group; a pair who had never met before the study scored furthest below MCE, while pairs who had come into contact more often still scored below MCE, but to a lesser extent. However, the experimental setup allowed potential for the sender to hear the receiver's calls and rearrange the cards to increase the number of hits. Rice and Townsend (1962: 215) acknowledge this flaw, but argue that this would have been unlikely to occur under the view of the experimenter, and that it is improbable that this was the cause of the below-MCE scoring of the unrelated pairs. Nevertheless, a more secure setup would have been desirable to eliminate this possibility.

Moss (1969) conducted a free-response study in which she compared 23 pairs who knew each other well with 31 pairs of strangers. Targets consisted of a series of slides accompanied by related sound effects, designed to induce a particular emotion. Three pairs of targets with contrasting emotions were created, with each sender-receiver pair performing a trial for each pair of targets. Similarly to the study of Rice *et al*. (1966), the use of emotional targets was a positive feature of the research; however, neither of the two groups of participants achieved significant results, and there was no difference between them.

Beer (1971) compared 15 married couples and 15 male-female stranger pairs. Each pair performed two forced-choice GESP Zener card runs, with roles reversed for the second run. Married couples scored significantly above MCE, while the stranger pairs scored at MCE. However, married couples were tested in their own homes, and it appears that the possibility of sensory leakage was not fully eliminated.

Shrager (1978) tested 38 children, aged between three-and-a-half to five-and-a-half years old. Each child took part in two GESP sessions, once with their own mother as sender, and once with a stranger mother as sender. Each session consisted of two runs of 25 forced-choice trials, using the five colours of M&M's sweets as targets. Mothers were also interviewed to gain further information about their relationship with their child, such as their closeness, satisfaction and perceived similarity. In the own-mother condition scoring was non-significantly above MCE, but in the stranger-mother condition scoring was significantly below MCE; the difference between these conditions was significant. Scores derived from the interview data were not significantly related to ESP scores for either condition; nevertheless, the attempt to quantify closeness of relationship is a very important aspect of this study, and one that has been neglected by many researchers. This will be discussed in more depth later in the chapter.

Stuart (1946) employed a free-response design with four magazine pictures as stimuli, all of which were used as targets in a randomised order, for four consecutive trials. Receivers drew their impressions on paper, and rankings were made matching stimuli to responses and vice versa, by sender, receiver and an independent judge. One hundred and twelve experimental sessions were carried out using 31 different

receivers, with the number of trials performed varying between receivers. Six of the sessions used ‘related’ pairings; two were MZ twins, three were married couples and one was an engaged couple. Eighty-four sessions used ‘unrelated’ pairings, and the remaining 22 sessions had the researcher as receiver. Based on the receiver’s rankings alone, the related pairings scored significantly above MCE and the unrelated pairings scored significantly below MCE; since the related pairings each only took part in one session, Stuart compared these to a similar group of 25 sessions of unrelated pairings, finding a highly significant difference between their scores. The sessions using Stuart as receiver produced above-MCE but non-significant scoring. The study contained several issues; Stuart (1946: 30) conceded that the small number of related pairings could “justify little confidence” in the result, and also identified that the sender’s judging score was “of questionable validity” (Stuart 1946: 34). There was no time limit for the receiver to produce drawings, so the sender could potentially match more complex drawings with lengthier trials; in addition, based on their knowledge of the receiver, they may have been able to estimate the order of the drawings from any sequences of ideas contained within them (Stuart 1946: 33). Despite these issues, the senders’ scores were not significant. However, the sender and receiver were brought together in the same room for judging, allowing potential for sensory leakage to increase the scores of receivers; despite the researcher’s warnings not to give any signals, related pairings may have been better able to detect subtle or unintentional cues than unrelated participants.

Bem and Honorton (1994: 8) report that, of the 28 ganzfeld studies included in Honorton’s (1985) meta-analysis (discussed in Chapter 1), 17 of the studies allowed participants to bring friends as senders, 8 did not, and 3 had no senders. It is unclear

how many participants actually brought friends, or if these 'friends' also included close relatives, but the 17 studies as a whole had significantly higher hit-rates than those with laboratory-assigned senders (Bem & Honorton 1994: 8-9). However, in Hyman's (1985: 28) prior analysis, he had assigned a 'documentation' flaw to studies that did not report critical details, particularly those regarding whether the sender was a friend of the receiver. It thus appears that Hyman considered any positive effect of sender-receiver friendship to be due to the potential for cheating, rather than for enhanced ESP (Honorton 1985: 77). By itself, this may seem to be a rather over-cautious suggestion; however, given the numerous other flaws identified by Hyman (1985) in the studies in this database, this caution is perhaps justified.

In their report of 187 ganzfeld sessions at the Psychophysical Research Laboratories (PRL), Honorton and Schechter (1987: 38) noted that ESP scoring was positively related with scoring highly on the Feeling and Perceptive (FP) dimensions of the Myers-Briggs Type Indicator. Furthermore, extraverted FP types performed better with friend senders than with laboratory senders, whereas the reverse was true for introverted FP types. This reflected a general tendency for introverts to use laboratory senders while extraverts brought friends. Bem and Honorton (1994) later reported the complete results of the PRL ganzfeld programme, consisting of 197 sessions in which the sender and receiver were friends, and 132 in which they were not. Pairings of friends did obtain a relatively higher hit-rate, but the difference was not significant. As discussed in Chapter 1, the PRL studies have been praised for their high quality, most notably by Hyman (1994). Hyman (1994: 21) did identify problems with randomisation, but Bem (1994: 26-27) argued that these issues showed no evidence of having produced the overall above-MCE scoring. These studies therefore provide one

of the more compelling demonstrations of ESP in the parapsychological database, but do not support the hypothesis that the sender-receiver relationship affects task success.

In their attempted replication of the PRL ganzfeld studies, using much of the same equipment including the mixture of static and dynamic targets, Broughton and Alexander (1997) conducted a series of sessions using emotionally close pairs, including married couples, parent-child pairs and siblings. They specifically excluded newlyweds and courting couples as being potentially less conducive to ESP, due to the anxiety-prone nature of these periods in relationships; however, this decision was based on the advice of a single clinical psychologist, rather than on more comprehensive research evidence. The study overall produced non-significant results, but the 51 trials of emotionally close pairs did produce a hit-rate that was significantly above MCE. This result was due to the high scoring of siblings and parent-child pairs; married couples scored non-significantly below MCE, as did friend pairings, which were not included in the 'emotionally close' category. The researchers therefore suggested that the biological link between pairs may be important (Broughton & Alexander 1997: 223). Based on this suggestion, Dalton (1997), in her ganzfeld study using creative participants, performed a post hoc analysis on 15 of her pairs who were biologically related. Ten direct hits were obtained from these 15 trials, giving a significant hit-rate of 67%, above the already impressive 47% overall hit-rate of the study. Due to this very high hit-rate and the methodological rigour of the study, Dalton (1997) has provided one of the more striking demonstrations of ostensible laboratory ESP, but the small sample of biologically related participants, and the post

hoc nature of the analysis, means that this specific result must be interpreted with caution.

Parker (2000) compared 94 ganzfeld trials, in which a person known to the receiver functioned as sender, with 56 in which a member of laboratory staff took this role. This was another well-controlled study that provided significant overall evidence for ESP, but there was no significant difference between the two sender types in terms of direct hits, with staff senders performing slightly better. Parker (2000: 11) notes that mother-daughter pairs were "over-represented" amongst successful pairs, and that "nearly all [of the] good quality hits" were provided by receivers with known senders, but these claims are not supported statistically.

Thalbourne (2008) reported a free-response study, conducted in 1976, that compared 18 pairs of 'close-relaters' with 13 pairs of 'non-close-relaters'. The former group consisted of siblings, married and engaged couples, and pairs in male-female and male-male relationships. A notable feature of this study is that the non-close pairs were made up of participants who, in addition to not being close to their experimental partner, reported never having a close relationship with anyone. For each pair, ten trials took place using line drawings as targets; the receiver attempted to draw the drawing that the sender was viewing in each instance. The ten response drawings were then ranked against the ten targets by three independent judges. Two indices of success were used; based on mean ranks, both groups scored non-significantly negative, while based on binary hits, close-relaters scored at MCE and non-close-relaters scored significantly below MCE. However, Thalbourne (2008: 152) justifiably considered that the significant result may have been due to multiple

analyses, and the difference between the two groups was non-significant on both measures of success.

4.2.4. Comparison of Different Relationships

Several of the studies in the previous section, in addition to comparing known senders with unknown senders, examined different types of relationships. Several other studies have done likewise but without including an 'unknown' group, or have included pairs of strangers in a group alongside other types of non-close pairing. Figar (1959) connected senders and receivers to a plethysmograph each, to measure their peripheral blood flow. At irregular intervals the researcher provided the sender with a multiplication calculation to perform, which led to a corresponding vasoconstrictive reaction; it was examined whether a similar reaction occurred for the receiver. Sixteen pairs of participants took part in 119 trials overall; in 44 of these trials a corresponding vasoconstrictive reaction was observed in the receiver. Although no detailed statistics are provided, Figar (1959: 168) notes particular success in pairs consisting of members of the same family, with a "very remarkable" synchronisation of the plethysmographic record identified for one mother sender-son receiver pairing. However, it does not appear that the plethysmograph traces were blindly judged; furthermore, participants were in the same room, just 2.5 metres apart and separated only by a heavy curtain, so there was a possibility of sensory leakage. Figar (1959: 165-166) reports that no receivers were consciously aware of obtaining any information via normal means, but there remains the possibility of subconscious responses to subtle cues.

Haraldsson (1970) conducted three series of forced-choice experiments with the receiver connected to a plethysmograph and targets that were names the receiver had selected as having particular emotional significance. Pairs of participants took turns as sender and receiver, and the three series in total consisted of 2,666 trials from 188 participants. Plethysmograph traces did not produce any meaningful results, but for pairs with a close relationship (related, married or very close friends), there was a significant positive correlation between the number of hits on each name and the intensity of emotion attached to the name, as rated by the participant who selected it. This correlation was negative and non-significant for 'fairly good' friends and casual friends. However, it is unclear how the groups differed in terms of overall numbers of hits.

Hearne and Worsley (1977) conducted a novel dream ESP study with 8 pairs of participants sharing a common phobia of either spiders or rats. Four of these were good friends or lovers, while the others were casual acquaintances or strangers. There were 14 participants in total, with two of these acting in roles of sender and receiver on separate occasions. The receiver slept in the laboratory whilst their eye movements and heart rate were measured. Upon the beginning of the relatively long third or fourth rapid eye movement (R.E.M.) period of the night, the experimenter began a series of ten one-minute-long trials. These were randomly selected as either experimental, in which the sender was presented with the animal of which they were phobic, or control, where the animal was removed. Differences in sleep patterns meant that between one and four blocks of trials were run for each pair. There was no evidence of any physiological reaction in the receivers in response to the presentation of the phobic stimulus to the senders, and there were no differences between the

emotionally close and non-close pairings. However, the researchers accurately note that measuring the heart rate of the sender may have allowed a better determination of any correspondences between the two participants (Hearne & Worsley 1977: 438).

Hearne (1977) also conducted a study using EEG recording. Eight pairs of participants took part, consisting of 12 males and 3 females; one male acted in roles of sender and receiver on different occasions. Half of the pairs were emotionally close (good friends or lovers) while half were not (casual acquaintances or strangers). Receivers sat in a darkened room, and were exposed to a brief flash of light approximately every two seconds, to evoke a Visual Evoked Response (VER) in their EEG, recorded from the occipital cortex. Each receiver undertook eight trials of 100 light flashes. In half of the trials the sender viewed a tachistoscope that briefly displayed a photograph of the receiver at the same time that the receiver saw each light flash; in the other half of the trials the tachistoscope was not used, as a control. Results demonstrated that the amplitude of a negative peak, occurring approximately 65ms after stimulation (N65), was significantly lower for the trials in which the sender viewed the photograph. There was an interaction between closeness of pairs and the experimental condition; for the close pairs the N65 amplitude was similar in the two conditions, whereas in non-close pairs the amplitude was significantly higher in control trials than the trials in which the tachistoscope was used. Although this is an intriguing result from a well-controlled study, analyses were made of amplitude and latency measures of four peaks in the waveform, increasing the possibility of artefacts from multiple analyses. Hearne (1977: 656) rightly called for independent replications to confirm his findings, but it does not appear that these were forthcoming. ESP research using EEG will be discussed in more depth in Chapter 6.

Alexander and Broughton (1999) conducted a ganzfeld study with 50 trials, which were a mixture of GESP and clairvoyance. The overall hit-rate was 36.0%, which was marginally non-significant; however, the clairvoyance trials produced a higher hit-rate than the GESP trials, at 46.2%. For the GESP trials, parent/child pairs achieved a hit-rate of 44.4%, in comparison to friends who achieved just 16.7%. This appears to support the researchers' earlier finding (Broughton & Alexander 1997) of an apparent advantage for biologically related pairings, but no inferential statistics are presented relating to this comparison.

4.2.5. Liked Senders and Disliked Senders

Several studies have attempted to measure the quality of relationships, in terms of whether the participants in a pairing like or dislike each other. Casper (1952) obtained 20 college students, comprising 10 males and 10 females who were all personally acquainted with each other, and asked them to rank the other participants in terms of how much they liked them. It was planned for each participant to take part in two sessions as receiver; in one session they would be paired with their most-liked person of the opposite sex, and in the other they would be paired with their least-liked person of the opposite sex. However, the researcher was only able to test 19 'most-liked' pairings (including two sessions with the same receiver who had rated two other participants as most-liked) and 8 'least-liked' pairings. Forced-choice methodology, using Zener cards, was employed; each session consisted of two runs of GESP and two runs of clairvoyance. Unfortunately the study contained a potentially important flaw, due to the signalling system used between the participants. Each participant's room contained a small light; the sender switched both lights on when a card was in

position, and the receiver switched both lights off after recording their call. This allowed participants the possibility of creating a code denoting the target, based on the time between the lights being switched off by the receiver and on by the sender. Despite this issue, results were not as hypothesised. In GESP runs, contrary to expectation, participants scored below MCE with senders they liked best, and above MCE with senders they liked least; this difference was significant. In clairvoyance runs, the directions of scoring were reversed, but the difference was not significant.

Anderson and White (1958) carried out a GESP Zener card test using two teachers as senders and 51 high school senior class pupils as receivers. All receivers were present in the same session, which consisted of 125 trials. The pupils were told the names of the teachers, but were not told that they were attempting to send different sets of symbols. Unlike the previously-mentioned classroom studies of Van Busschbach (1955) and Louwerens (1960), sensory leakage was eliminated by placing the senders in a separate room, but the potential issue of receivers influencing each other's calls remained. Following the ESP test, the students were asked to write down their favourite high school teacher and three others they would have preferred as teachers. For one of the teachers, rating them as favourite or preferred was significantly associated with scoring above MCE. The same result was observed for the other teacher, but not to a significant degree, although the outcome remained significant with both teachers' results combined.

White and Angstadt (1963b) performed a similar study to Anderson and White (1958), using two tenth grade biology classes, containing 53 participants in total, who acted as receivers. Each class voted for a sender, and the two classes were tested in

different sessions, so that both senders could send at the same time for each class. Targets were playing cards; in both sessions the two senders were each given a set of 20 cards taken from the same deck, ensuring that there would be no overlap between senders' targets in a session. This was a notable improvement over the study of Anderson and White (1958), where considerable overlap of Zener card symbols may have occurred. Unlike Anderson and White's (1958) study, receivers were aware that there were two 'competing' senders; small monetary rewards were offered to motivate receivers to score highly on their own sender's targets. The researchers used a scoring system devised by Fisher (1924) and later revised by him (Jephson 1928: 269-271); this assigned values for every possible relation of the call to the target, considering colour, suit, rank (face card or number card) and value (denomination). Results demonstrated the hypothesised tendency for receivers to score above MCE on their own sender's targets and below MCE on those of the other sender; this analysis was not independently significant for either class but was significant for both classes combined.

White and Angstadt (1963a) subsequently performed a replication attempt with four ninth-grade English classes in a different school, allowing two sets of paired classes and including 93 receivers in total. However, there were some differences from the previous study; digits from 1-10 were used as targets instead of playing cards, 50 calls were made by participants instead of 20, and no rewards could be offered due to the school's regulations. Each participant was also asked to state whether they had voted for their class's sender, and whether they preferred their own sender or the sender of the competing class; this was an important modification as it allowed for the likely possibility that the elected sender may not have been preferred by all of their

classmates. Three of the classes elected a male sender, and one elected a female sender. Due to a post hoc finding from the previous study that suggested better scoring when the sender and receiver were of opposite sex, the female-sender class and one of the male-sender classes were paired as an 'experimental' group, while the other two male-sender classes were paired as a 'control' group. The results for neither group were significant; however, stronger results were obtained when examining the 'preferred' sender rather than the elected sender, with the experimental group scoring in the hypothesised direction, although to a non-significant degree.

Solfvin, Roll and Krieger (1978) performed a study with a group of 16 students, consisting of 11 males and 5 females, who were trained in a meditation technique. A remote viewing free-response paradigm was used, where on each trial a randomly selected student would visit a geographical location as the target. The 15 remaining participants acted as receivers, and were given four locations (including the visited one) to rank based on their impressions during the trial; a majority vote procedure was used to produce overall rankings from the group, but individual rankings were also analysed. Participants were asked to rank all of the other students based on how much they liked being with them; this allowed subgrouping of receivers as to whether they liked or disliked the sender, and whether they were liked, disliked or felt moderately towards by the sender. Six trials were performed; the main analyses showed no evidence of ESP and no evidence of any effect of the receivers' liking of the sender or vice versa. However, post hoc analysis demonstrated a significant positive correlation between the majority vote target rank and the proportion of receivers who liked the sender. Based on this result, the researchers argued that the "liking-disliking separation has been a fruitful one" (Solfvin *et al*. 1978: 157), and suggested that this

supported the use of a group voting procedure (Solfvin *et al*. 1978: 155-156), but the post hoc nature of this analysis, together with the non-significant main analyses, would suggest that more cautious conclusions are warranted.

4.2.6. Measures of Connectedness

In addition to the 'liked vs. disliked' dimension, a few studies have used different measures to assess connectedness between pairings and subsequently make hypotheses about how they will perform; one such study, by Shrager (1978), has already been mentioned. Another study of this kind was conducted by Schmeidler (1958), who included a GESP component as part of a study to test her ideas around the possibility of the sender providing "paranormal encouragement" (Schmeidler 1958: 47; this study is discussed in more detail shortly). Schmeidler used Zener cards that were coloured in five different colours; receivers therefore called both the symbol and colour for each card, so each deck provided two runs of guesses. Each participant took part in four runs (two decks) of GESP. If a pair of participants did not know each other well, they loaned each other a personal possession as a way of establishing a connection. Participants were also given the Rorschach test to examine whether scoring was related to the potential for friendship between the sender and receiver, as well as an interview in which participants could make clear whether they were already friends or in love, or if they held any particularly positive or negative views regarding the experiment. (The use of the Rorschach test is a potentially contentious issue; this will be returned to later in the chapter). After each pair took part in the study, but before their test responses were seen, a hypothesis was made as to whether scoring would be above MCE or not, based on the results of the Rorschach tests, interview

responses and observations of social behaviour. Overall scoring from 146 participants was not significant, but significant results were obtained such that participants who were expected to score above MCE tended to do so, and participants who were expected to score below MCE tended to do so as well.

Wiesinger (1973) performed a GESP test using the numbers 0-9 as targets, with classes of 325 schoolboys as receivers and teachers as senders. Each participant made guesses for two runs of 25 calls. Measurements were taken of the children's attitude towards the teacher, the teacher's attitude towards the children, and the children's belief in the teacher's attitude towards them; unfortunately the report consists only of an abstract of a doctoral thesis and does not give further details on how these attitudes were measured. There were no correlations between ESP scoring and any of these attitude measures. The overall result was not significant, but two further experiments with children as senders did produce significant results; in these experiments scoring was not related to the attitude of the senders, but receivers performed significantly better if they believed the sender had a positive attitude towards them. Post hoc analyses purportedly suggested that there was significant psi communication among the children, with children taking their calls from the most popular classmates and avoiding the unpopular ones; however, although neighbouring children were omitted from these analyses this would suggest thought concordance rather than ESP, exacerbated by the classroom testing environment and its potential for sensory leakage.

Most recently, Schönwetter, Ambach and Vaitl (2011) employed a modified version of the Guilty Knowledge Test, using 20 pairs of friends, 29 couples and 3 pairs of

siblings. The sender became familiar with one object from each of seven categories (e.g. household objects) during a mock task, which was designed to induce negative emotional arousal. Following this, the receiver was shown 35 pictures of objects (five in each of the seven categories), including those that had been involved in the sender's task; differences were examined in physiological responses (electrodermal activity, respiration, heart rate and pulse) and reaction times between pictures of the target objects and the decoys. For every object viewed the receiver was asked to respond "yes" only if they were absolutely certain that the object had been involved in the sender's task. Subsequently the five pictures from each category, including the target from that category, were displayed simultaneously; the receiver had to guess which picture was the target. Both participants completed the Questionnaire for the Evaluation of Connectedness in Relationships (Schmidt, Tippenhauer & Walach 2001), creating a connectedness score for the pair by averaging the two individual scores. None of the physiological, reaction time or guessing measures demonstrated any evidence of ESP, and none of these measures showed any correlation with connectedness scores. The researchers suggest that these results may have been due to the unusual asynchrony between presentation of targets to the sender and responses by the receiver (Schönwetter *et al*. 2011: 109). Although indeed unusual in parapsychological research, the design would still appear to allow for the possibility of GESP at the time of target presentation, and for either telepathy or retrocognition at the time of responding, so this argument is not particularly strong.

4.2.7. Created Pairings

In addition to assessing the connectedness of pairings, several studies have attempted to create pairings who are matched using a particular measure. Following her first study using the Rorschach test (Schmeidler 1958), Schmeidler (1960 cited in Schmeider 1961: 6) performed a second study where Rorschach tests were performed before appointments for the ESP test were made. On the basis of their responses, participants were assigned to the role of sender or receiver, and hypotheses were made about the success of each pairing. Participants were obtained from Schmeidler's psychology classes but pairs were never created from members of the same class; they did not see each other or obtain any knowledge about each other until after the ESP test. Forty-seven pairs were tested, again using two decks of coloured Zener cards, effectively providing four runs of guesses. There was a slight tendency for participants who were expected to score above MCE to score positively, and for participants who were expected to score at or below MCE to score negatively, but results were not significant (Schmeidler 1961: 18).

Schmeidler (1961) subsequently conducted a third study with a very similar method, although some pairings were composed of members of the same psychology class, and pairs met to hear the test instructions together. Participants were assigned to pairs and to the role of sender or receiver before their behaviour with each other had been observed and before their attitude towards the study was known. Fifty pairs were tested, 26 of whom were expected to score above MCE; this group did indeed score above MCE, although non-significantly so. The other 24 pairs were expected to score at or below MCE, and scored significantly below MCE; the difference between the

two groups was significant. From the results of her second and third studies Schmeidler (1961: 19) thus suggested that successful pairings could be identified using the Rorschach tests alone, as long as the two participants knew each other. However, despite the apparent success of Schmeidler's predictions, the Rorschach test has been criticised for its poor reliability and validity (Lilienfeld, Wood & Garb 2001: 82-83); indeed, Schmeidler (1961: 31) concedes that the test is unreliable and that her "chief regret about this series of experiments is that the Rorschach interpretations were not supplemented with…standardised personality tests". While this acknowledgement is creditable, it suggests that Schmeidler's conclusion regarding the predictive value of the Rorschach test is rather weak.

Velissaris and Velissaris (1977) used measures of 'recent experience' and 'social readjustment' to create seven triads of participants based on types of recent experiences and the salience of those experiences in the memory of the participant; within these triads two participants were closely matched on this basis while the third participant was not. One of the matched participants acted as sender in a free-response task, while the other two participants drew their impressions and then ranked them against five pictures, one of which was the target; a second trial was then performed with the other matched participant as sender. In addition to the receivers' rankings, an independent observer was also used to judge the correspondence between the target picture and the drawings. The study report consists only of an abstract of an article published in an obscure journal, and states that the results "suggest an influence of the similar experience-memory factor on psi success" (Velissaris & Velissaris 1977: 159); however, it is unclear whether the results were significant or merely suggestive.

Collymore (1978) tested participants using a measure of religious values, to classify participants as high or low scorers. Participants were then randomly assigned the roles of sender or receiver and were paired in a 2x2 between-groups design with religious values (high or low) and participant role (sender or receiver) as independent variables; this therefore examined the effect of using pairs of participants with similar and differing religious values. The study report consists only of an abstract of an unpublished manuscript and does not state whether the study employed forced-choice or free-response methodology, or what types of targets were used. Twenty-seven pairings were each tested for 12 trials, but no evidence of ESP was obtained, nor was there any effect of pairing type on scoring; the researcher suggested this was due to the small size of the groups and the relatively restricted range of religious values scores in the sample (Collymore 1978: 153).

4.2.8. Hypnotically-Induced Closeness

Other studies have attempted to induce a close relationship between participants during the study, using hypnotic techniques. Casler (1969) attempted to hypnotically induce interpersonal feelings between 15 same-sex pairs of participants who had not met before the study. Each session consisted of three 'segments', occurring in a randomly selected order. In Segment 1 the participants performed three GESP Zener card runs without being hypnotised. In Segment 2 the three runs were performed after the sender was hypnotised to believe that the receiver was his closest friend and therefore that ESP was certain to occur; the receiver was not hypnotised. In Segment 3 the receiver was hypnotised with the same suggestions, but the sender was not. The hypnotic suggestions were accepted by all participants except for one sender. Scoring

was not significantly different from MCE, nor were there any differences between groups, although scoring tended to be higher in Segment 2. It is regrettable that there was no fourth segment with both participants hypnotised; Casler (1969: 338) stated that further research using such a condition was being planned, but there does not appear to be any record of a follow-up study in the literature.

McBain *et al.* (1970) screened 77 college students for hypnotic susceptibility, and created 22 pairs based on similarity of concepts on a semantic differential scale. Forced-choice methodology was used, but instead of Zener cards, targets were a set of five concepts expected to produce affective reactions; these were selected to be specific for each pair. Participants were given posthypnotic suggestions "to concentrate, to strive for close rapport with partners, and to accentuate affective reactions to specific concepts" (McBain *et al*. 1970: 67). Participants took turns as sender and receiver in three weekly sessions, although it is unclear how many runs were performed. Hitting was significantly above MCE, with positive scoring correlated with hypnotic susceptibility of the sender. This finding of a positive correlation between scoring and hypnotism of the sender is an interesting parallel between this study and that of Casler (1969); however, the result in the latter study was non-significant, and so this cannot be considered a replicable finding without additional evidence.

4.2.9. Summary of Sender-Receiver Relationship Research

The reviewed studies display a wide array of different methods and techniques, but also a range of differing findings. Overall, approximately half of the articles

(including those that summarise a group of studies) claim results that are significant, either in terms of overall evidence for ESP or evidence for the advantage of a close relationship in ESP scoring. Some of the significant studies display admirable rigour, while others are rendered less persuasive due to methodological issues or the post hoc nature of the analyses. The overall impression of this research is therefore that, while markedly inconsistent in terms of methodology and results, and therefore far from a convincing demonstration of a replicated effect, there are a sufficient number of positive results from adequately-controlled studies to retain the ESP hypothesis as a possibility, and to tentatively suggest that the sender-receiver relationship may have some bearing upon ESP task success.

One of the most surprising features of this body of research is the small number of studies that have attempted to quantify the closeness of relationship between the members of a pair. Often categorisation into groups has been used, sometimes with a single group containing several different types of pairing (e.g. romantic couples, friends, siblings etc.), despite the fact that relationship quality and strength may differ within and between these pairings. One particular impact of this lack of use of closeness measures has been a tendency to examine pairs as a unit rather than more specifically examining the roles of sender and receiver; however, several studies have attempted to do this (e.g. Casler 1969, Collymore 1978, Solfvin *et al*. 1978, Wiesinger 1973). Based on Schouten's (1983: 332) suggestion, that the probability of becoming the percipient in a spontaneous ESP experience is higher for the individual who is more emotionally dependent on the other, it would follow that laboratory studies should find higher ESP scoring when the more emotionally dependent partner is the receiver. If this is indeed the case, this may explain some of the inconsistency in

findings, particularly in studies where participants in a pairing only performed either the sender or receiver role and thus may not have been maximising their potential for ESP if the more emotionally dependent partner was allocated the role of sender. The assessment of relationship closeness in pairings, particularly this two-way aspect, is therefore a key improvement that needs to be incorporated in research examining the sender-receiver relationship.

4.3. Sex Pairing

Numerous studies, including several of those discussed earlier in this chapter, have examined the effect of the sex of participants on task success. A number have found significant results; for example, in Louwerens' (1960) study using young children, with teacher senders (all female) the girls scored significantly above MCE, while the boys did not. With the researcher (also female) as sender, boys' results were close to significance, while the girls scored close to MCE. In Van Busschbach's (1955) study using primary and secondary schoolchildren, girls' scoring was significantly above MCE, whilst boys' scoring was not; however, the difference between the sexes was not significant. Beer (1971) found that the husband in 11 of 15 married pairs scored higher as receiver than did the wife, but the male scored higher in only 4 of the 15 unmarried pairs. McBain *et al*. (1970), in their study using created pairings and hypnotic suggestions for rapport, obtained significantly higher scoring for same-sex than different-sex pairings. White and Angstadt (1963b) found that the tendency for their participants to score above MCE on targets sent by an elected member of their own class, and below MCE on targets sent by a member from another class, was significant for females but not for males; further post hoc testing found this scoring

tendency was significant when sender and receiver were of different sex, but non-significant when they were the same sex.

However, there have also been many non-significant findings. For example, while White and Angstadt's (1963a) attempted replication of their previous study did find some similar results, none of them reached significance. In Beloff's (1969) study, it was noted that female receivers (who were all with male senders) scored consistently higher than males (who were all with female senders), but this difference was not significant. Broughton and Alexander (1997) found slightly, though non-significantly, higher scoring for male receivers, while Shrager (1978) found no significant differences between the sexes.

Overall, while the research examining the sender-receiver relationship contains a reasonable proportion of studies that allow this factor to remain at least suggestive of having an influence on ESP task success, this is not the case for sex pairing research, where there is no clear pattern within the findings. Schmeidler (1994: 152) concisely summarises the situation: "Many reports show higher ESP scores in males than females; many show higher scores in females than males; many show no gender difference. Since they sample different groups tested in different conditions, the work is uninformative". This situation is exacerbated by the apparently post hoc nature of many of the analyses. However, this lack of a consistent effect in laboratory research coincides with a much more consistent result found in spontaneous case research, such as that of Schouten (1979, 1981, 1982, 1983) and the study presented in Chapter 3. A majority of ostensible GESP experiences have female percipients, but the number of female and male percipients is much more balanced in cases with no target

person; this suggests that there is no difference in the ESP ability of the sexes, but that the female bias occurs in GESP experiences due to a tendency for the percipient to be the individual who is more emotionally dependent on the other person (Schouten 1983: 330-332). It would therefore seem fairly conclusive, from the results of both spontaneous cases and laboratory research, that the sexes do not differ in ESP ability.

Despite the apparent lack of any difference in ESP ability of the sexes, some more recent findings have been suggestive of a replicated effect. Few studies have systematically examined the four combinations of sender-receiver sex pairing, but one researcher who has done so is Dalton (1994). She combined the results of three ganzfeld studies conducted by herself, Schlitz and Honorton (1992) and Cunningham; the latter was presented as one of two studies by Morris *et al*. (1993 cited in Dalton 1994: 105). These studies were chosen as they all had small *N* and were conducted by female researchers. When combining the trials from the three studies Dalton (1994: 110) reports that female sender-male receiver pairings achieved the highest percentage of direct hits (55%), followed by male sender-female receiver (50%), then female-female (41%) and finally male-male (39%). However, on closer inspection of Dalton's report, an error appears to have been made; the number of female sender-male receiver pairings decreases from 12 to 11 (Dalton 1994: 109-110), with the latter figure causing the hit-rate percentage to increase from 50% to 55%. Correcting this error renders the female-male pairings as only equal highest alongside the male-female pairings, rather than outright highest. However, the overall advantage of mixed-sex pairings is unchanged.

While Dalton's analysis is of interest, the small sample sizes mean that the combined scores do not reflect general patterns apparent in all three studies. Dalton's study did show higher scoring for mixed-sex pairings, while same-sex pairings performed best in Cunningham's study, and all pairings performed equally for Schlitz (Dalton 1994: 111). However, a ganzfeld study of 80 trials by Hume (2003: 146-147) demonstrated the same pattern as reported by Dalton, with female sender-male receiver pairings performing best, as in Dalton's original erroneous report. Dalton (1994: 111) had speculated that the poor male-male performance may have been due to male participants feeling uncomfortable reporting their imagery to a female experimenter when the senders, who could hear their mentation, were also male; Hume's similar findings with a male experimenter suggest this is not the case. However, Hume (2003: 148) noted that his mixed-sex pairings were usually in romantic relationships, suggesting that any apparent advantage for these pairings may be due to their emotional closeness rather than their sexes per se. This apparent replication of an unexpected effect of sex pairing means that there is a need for a study that examines the sex and emotional closeness variables together to identify which, if any, is more important in determining ESP task success. From the research findings presented in this chapter, and from the theorisation of Schouten (1983: 330-332), it may be anticipated that Hume (2003: 148) is correct in interpreting his apparent finding of sex pairing differences as an artefact of an effect of the closeness of relationship between the two members of the pairing.

4.4. The Role of the Sender

So far the discussion has generally assumed that ESP tests involving a sender are tests of telepathy, at least in part; the term GESP reflects the fact that, with a physical target, it is difficult to be sure whether success in a trial is due to telepathy, clairvoyance, or a combination of both (Beloff 1993: 134-135). It is therefore important to consider whether the sender has any effect at all in GESP tests; if they do not, and the test is in fact entirely one of clairvoyance, this may explain some of the inconsistency in findings relating to the sender-receiver relationship and sex pairing.

Several of the previously-mentioned studies included comparison of GESP trials with clairvoyance. For example, Casper (1952: 217) found that most of the significance of his study as a whole was due to the GESP runs, and considered that this indicated the sender played an important role. Bem and Honorton (1994: 16) briefly report the results of a meta-analysis of 12 ganzfeld studies that used no sender; the overall hit-rate was above MCE but not significant, suggesting no evidence for ESP in the ganzfeld in clairvoyance conditions, in comparison to the significantly positive scoring in GESP conditions.

However, again there is inconsistency in the findings. For example, Broughton and Alexander (1997) conducted 50 trials of ganzfeld clairvoyance in addition to their GESP trials. GESP trials did obtain a hit-rate above MCE, while the hit-rate of clairvoyance trials was below MCE, but neither result obtained significance and the comparison between them was also non-significant. Beloff (1969) found slightly better scoring with clairvoyance than GESP, but to a non-significant degree, while

Alexander and Broughton (1999) found that ganzfeld clairvoyance trials obtained the highest scoring rate, at 46.2%, compared to parent/child (44.4%) and friend (16.7%) GESP pairings. However, in a review, Schmeidler (1994: 164) did consider there to be a general tendency for higher scoring in GESP than clairvoyance tasks.

Even if the presence of a sender is effective, this may not be due to any telepathic aspect. Morris *et al.* (1995 cited in Roe, Sherwood & Holt: 2004: 361-362) suggested that participants may see the possibility of obtaining extrasensory information as more plausible when an individual observes the target, and that having a sender may increase the feeling of teamwork as well as allowing sharing of successes and diffusion of responsibility for failures. This is related to the well-replicated 'sheep-goat effect', where participants who believe in the possibility of ESP, termed 'sheep', tend to perform better than those who do not, termed 'goats' (Schmeidler 1952, Lawrence 1993). A suggestion of this effect being related to the sender-receiver relationship was reported by Thalbourne (2008: 153); he found evidence of the sheep-goat effect, and also reported that his 'close-relaters' group scored more highly than the non-close group on a measure of paranormal belief that included an item regarding the estimated probability of ESP occurring in the study. Improved performance in GESP conditions may therefore represent the effect of greater expectation or motivation on clairvoyance, rather than the occurrence of telepathy.

Adding to this interpretation, Roe, Sherwood and Holt (2004: 361) observed that, in many of the studies that have compared GESP with clairvoyance, participants were aware that there would be no sender for some trials, leading to expectancy or motivation effects. Roe *et al*. (2004: 363-364) identified seven ganzfeld studies that

had directly compared sender and no-sender conditions within the same study; all seven reported better performance with a sender present, and two were significant. However, Roe *et al.*'s (2004) own study produced non-significantly better scoring in the no-sender condition, and examination of receiver expectancy of the presence of a sender suggested that this was more important than the sender's actual presence. A later dream ESP study conducted by the same research team (Roe *et al.* 2007) similarly found no effect of the presence of the sender, but also found no effect of expectancy.

Despite these findings, some research has suggested the sender can have an impact that does not just depend on expectation or motivation. Schmeidler (1958: 47-48) considered that, if the sender does have a paranormal effect in laboratory GESP studies, this effect may occur in either of two ways. Firstly, as implied by the terms 'sender' or 'agent', the sender may genuinely 'transmit' the target material. Alternatively, the sender's role may be to paranormally encourage the receiver as they make their clairvoyant responses. One may also suggest that, in light of Rhine's (1978: 22) claim that the percipient, or receiver, is the more active party, the use of a sender may effectively provide a second target in the form of the sender's mental experience of the physical target. Thus, if telepathy and clairvoyance are both genuine phenomena, a GESP study provides an opportunity for the receiver to use either, increasing the probability that they will be able to gain information about the target.

Schmeidler's three studies examining participant compatibility using the Rorschach test, discussed earlier (Schmeidler 1958, Schmeidler 1960 cited in Schmeidler 1961: 6, Schmeidler 1961), were also used to test her ideas around the possibility of the

sender providing "paranormal encouragement" (Schmeidler 1958: 47). Each receiver responded to four decks of Zener cards, which were coloured in five different colours; receivers called both the symbol and colour for each card, so each deck provided two runs of guesses. For two decks (four runs) a GESP procedure was used, and for the other two decks a clairvoyance procedure was used, with the targets sealed in envelopes; for one deck the sender was instructed to hope that the receiver would succeed, and in the other the sender was instructed to hope that the receiver would fail. Receivers did not know which instructions the sender was following in any particular run.

When combining the results of all 239 participants from the three studies, there was a significant, weak, negative relationship between GESP scoring and scoring on 'failure' runs. This may suggest that senders who were proficient at sending the target during GESP runs were also better able to will the receiver towards failure. Comparison of the GESP vs. failure and GESP vs. success correlations produced a near-significant result, as did comparison of the GESP vs. failure and success vs. failure correlations. Schmeidler (1961: 23) thus interpreted these results as indicative of different processes occurring between success and failure conditions, and between GESP and success conditions. In addition, for participants who scored above MCE in GESP trials, the correlation between success and failure conditions was negative; for participants who scored at or below MCE in GESP trials, this correlation was positive. The difference between these correlations was near-significant; Schmeidler (1961: 24) thus suggested that participants who were more successful at GESP trials tended to make more of a distinction between success and failure "messages" from the sender than did participants who were less successful at GESP. Overall, Schmeidler (1961:

29) concluded that "telepathy can be a major factor in ESP responses", but also argued that part of the sender's role is the "general facilitation or inhibition" of the receiver's response (Schmeidler 1958: 62). However, Schmeidler based these conclusions on several results that did not reach significance, so they must remain somewhat tentative.

Kreitler and Kreitler (1973) also found positive results in this respect; trials in which the sender was actively sending the target produced significantly higher scoring than trials in which the sender was only thinking about the target. However, this was only the case when the ESP stimulus contradicted information provided to the receiver through subliminal stimuli. More recently, Roe, Holt and Simmonds (2003) used a novel approach that involved placing a computerised random event generator (REG) in the receiver's room during GESP ganzfeld trials, unknown to the participants. While the receiver was providing their mentation, the REG was randomly selecting once a second from a pool of 768 descriptive statements; eight such statements were included in this pool from each of the 96 video clip targets, and consisted of accurate but not overly specific wordings such as "a sense of flying or floating" (Roe *et al*. 2003: 133). At the end of the trial, the 20 statements selected most often were used to form a "virtual mentation" (Roe & Holt 2005: 114). Receivers ranked four video clips for their resemblance to their mentation, while an independent judge performed the same process for the virtual mentation. Receivers achieved a significant hit-rate of 35%, while virtual mentation produced a near-significant hit-rate of 32.5%. A replication attempt including no-sender trials as a further comparison found greater success with virtual mentation in sender trials compared to no-sender trials, as rated by two independent judges (Roe & Holt 2005). Although this comparison was non-

significant, the researchers argue that these findings suggest that the sender may act as a psychokinesis (PK) agent (Holt & Roe 2006: 6-7). The debate regarding whether ESP and PK are aspects of a unitary phenomenon is beyond the scope of this thesis, but several theorists have attempted to argue that this is the case (e.g. Thalbourne 2004); indeed, the common use of the more general term 'psi' implies an uncertainty over the exact process ostensibly occurring for many paranormal phenomena. It would appear, though, that there is some evidence for psi, in some form, occurring in GESP studies due to the presence of the sender.

4.5. Summary

Overall, despite very inconsistent results, there is a general tendency for studies with senders to produce higher scoring than those without, either due to motivational and expectancy effects for the receiver or due to some genuine psi activity from the sender. For studies with senders, there is also some evidence that more closely bonded pairings perform better than those who are less closely bonded. Finally, for studies with senders, the sexes of the sender and receiver do not seem to have any consistent effects, although more recent findings examining the four pairing combinations have suggested an advantage for mixed-sex pairings.

There is still potential for further research examining the sender-receiver relationship and sex pairing. Many studies have simply categorised relationship pairings, while few have obtained quantitative measures of relationship closeness, particularly when pre-existing pairings have been used who have been assumed to be close. Fewer still have examined whether the sender-to-receiver or receiver-to-sender bond is more

important in determining success, meaning there is no clear experimental evidence supporting Schouten's (1983: 332) observations in this respect relating to spontaneous cases. The inconsistent findings relating to sex appear to support Schouten's (1983: 330-331) suggestion that the sexes do not differ in their ESP ability, although more recent findings (Dalton 1994, Hume 2003) have shown some evidence of a replicated effect. However, Hume (2003: 148) speculated that the apparent advantage of mixed-sex pairings was due to the number that were romantically attached, mirroring Schouten's (1983: 332) suggestion that the differing proportions of male and female percipients and target persons in spontaneous cases reflected the importance of the relationship between them, rather than their sexes per se. There is evidently a need for a study to clarify this issue by more fully assessing the strength of the bonds between sender and receiver, and attempting to examine whether it is these bonds, sex pairing, or a combination of the two, that determines ESP task success. The next chapter reports such a study.

Chapter 5

Ganzfeld Study Examining Sender-Receiver Relationship and Sex Pairing

5.1. Introduction

5.1.1. Rationale

The previous chapter presented a comprehensive narrative review of research that has either examined the effect of the sender-receiver relationship on ESP task success, or has used participants with an assumed close relationship in order to enhance task success. It has been seen that, despite numerous such studies being performed, there is little coherence in the research effort and the findings are somewhat mixed; however, there are a sufficient number of positive results from adequately-controlled studies to tentatively suggest that the sender-receiver relationship may have some bearing upon ESP task success.

One of the key issues identified with the sender-receiver relationship research base is the often rather arbitrary categorisation or grouping of relationships; for example Stuart (1946) combined friends and romantic pairings into a single group, without any acknowledgement of the potential differences between these types of relationships. In addition, it is possible for relationships within more well-defined categories to differ as to their quality, but few studies have attempted to quantify the closeness of relationship between participants, or to more specifically examine the roles of sender and receiver to identify whether sender-to-receiver or receiver-to-sender closeness is

more strongly related to task success. Schouten (1983: 332) argued that, in spontaneous cases of ostensible ESP, there is a tendency for the percipient to be the individual who is more emotionally dependent on the other person; therefore, it may be expected that receiver-to-sender closeness would be more important than sender-to-receiver closeness in determining laboratory ESP task success. As such, unmeasured variability in relationship quality within and between relationship categories, and within individual pairs, may explain some of the inconsistency in research findings.

In contrast to research examining the sender-receiver relationship, the overall interpretation of research examining sex pairing is more straightforward; there does not appear to be a consistent effect of sex pairing upon ESP task success. However, more recently, there has been some evidence of a replicated effect in research that has more carefully examined the four sex pairing combinations, with mixed-sex pairings obtaining higher scores than same-sex pairings (Dalton 1994, Hume 2003). As Hume (2003: 148) suggests, this may be an artefact of a tendency in these studies for mixed-sex pairings to be involved in romantic relationships, meaning that this is actually an effect of relationship closeness rather than sex per se. A similar situation exists in spontaneous case research, such as that of Schouten (1979, 1981, 1982, 1983) and the study presented in Chapter 3; a majority of ostensible GESP experiences have female percipients, but the number of female and male percipients is much more balanced in cases with no target person. This would seem to provide support for Schouten's (1983: 330-332) argument that the sexes do not differ in ESP ability, and that the sex differences apparent in spontaneous cases occur due to differences in emotional dependence within pairings. However, more clarity is needed on this issue, due to the

lack of laboratory research that has combined an examination of quantified relationship closeness with an examination of the four sex pairing combinations.

5.1.2. Justification for Methodology

5.1.2.1. Quantitative Assessment of the Sender-Receiver Relationship

The study to be reported in this chapter was designed to examine the effect of the sender-receiver relationship and sex pairing upon ESP task success, whilst including the key element of a quantitative assessment of the quality of participants' relationships with their experimental partner. This was achieved using a modified version of Schmidt *et al*.'s (2001) Questionnaire of Emotional Connectedness in Relationships (QECR), which has been used in previous parapsychological research by Schmidt *et al*. (2001) and Schönwetter *et al*. (2011). Due to the nature of the items on the QECR, this was only relevant to non-stranger pairings. It was therefore the intention to compare performance across the various relationship categories (stranger, friend, family and romantic) as in earlier research, and then to subsequently use the QECR scores as a more sensitive measure to compare performance between the various non-stranger pairings, in addition to examining whether sender-to-receiver or receiver-to-sender closeness was more important in determining ESP task success .

5.1.2.2. Use of the Ganzfeld Technique

Ganzfeld free-response methodology was used for this study, for several reasons. As discussed in Chapter 1, compared to forced-choice methods such as Zener card testing, free-response methodology has the advantages of being more interesting for

participants and more akin to the manner in which information is ostensibly obtained in spontaneous ESP experiences; however, it has the disadvantage of being considerably more time-consuming (Beloff 1993: 161). While the receiver is free to respond however they wish during the trial, the use of several potential targets against which to judge these responses still allows an objective statistical assessment of success, in the same manner as forced-choice studies (Beloff 1993: 161). Although a receiver's impressions may demonstrate an apparently impressive correspondence with the target, it remains possible that this correspondence is entirely coincidental, so the use of several 'decoy' targets in this manner is essential to evaluate this possibility.

Several free-response paradigms have been used in ESP research, including dreams, remote viewing and the ganzfeld. As discussed in Chapter 1, the dream ESP studies conducted at the Maimonides medical centre in New York (Ullman *et al*. 1973) produced a highly significant overall binary hit-rate of 63% from independent judges' rankings, compared to the 50% expected by chance (Radin 1997: 71-72). However, there were few replication attempts, seemingly due to the expense of maintaining a sleep laboratory, although researchers have continued to investigate dream ESP using less expensive and less labour-intensive methods, such as allowing participants to sleep in their own homes (Sherwood & Roe 2003: 93). Post-Maimonides studies have also produced significantly above-MCE scoring overall, although with a significantly smaller effect size than the Maimonides studies; this difference in success may be due to differences in methodology in home-dreaming studies, such as the inability to monitor R.E.M. sleep, synchronise sending of the target with R.E.M. periods, and deliberately awaken the receiver from R.E.M. sleep to record their dream recall

(Sherwood & Roe 2003: 104). Although these studies have produced positive results, this lack of control over important methodological aspects, together with the ability to only conduct one trial per night, renders dream ESP studies less desirable than others that allow greater control and quicker data collection.

While dream ESP research places the receiver in a particular state of consciousness in which they must attempt to detect the target, the term 'remote viewing' refers to a paradigm that uses a specific type of target, namely a real-life object or scene (Beloff 1993: 167). Such targets are deemed to be more similar to those in spontaneous cases of ESP, in preference to representations (images, video clips etc.) or symbols (Beloff 1993: 167-168). Remote viewing was used most notably, and apparently most successfully, by Targ and Puthoff (1977), but their research was heavily criticised (e.g. Marks 2000: 45-69). In these studies, the same receiver would undergo a series of trials, and the receiver's impressions for each trial were then transcribed and sent to an independent judge, who judged them against each of the targets used in the series; each trial's target was therefore effectively used as a decoy for every other trial (Marks 2000: 32-33). However, the receiver was informed after each trial what the target had been, and so the transcripts of the receiver's impressions contained cues that indicated the position of a transcript in the series, such as reference to a specific location that had been the target on an earlier day (Marks 2000: 47-48). The overall success of the remote viewing paradigm is therefore disputed, and the requirement for researchers to identify, and transport senders to, a series of different geographical locations increases the expensiveness and labour-intensiveness of a study.

As discussed in Chapter 1, the ganzfeld environment has been described as an "experimental-hypnagogic" procedure (Bertini *et al*. 1964: 496), referring to the state of hypnagogia that occurs between being awake and falling asleep (Alvarado 2000: 193). This state is induced in the receiver by providing them with homogenous visual and auditory stimulation, and facilitates drowsiness while simultaneously encouraging the creation of spontaneous imagery (Bertini *et al*. 1964: 495). This technique was introduced into parapsychological research by Honorton and Harper (1974), due to its potential to create an "internal attention state" (Terry & Honorton 1976: 216) through its reduction of sensory input and processing and its subsequent potential to allow relatively weak psi impressions to be more easily detected (Honorton 1974: 250); it is therefore suggested that the imagery and ideation produced by the procedure are capable of bringing psi information into consciousness (Honorton & Harper 1974: 160).

The ganzfeld technique has arguably produced the best evidence for ESP in the parapsychological database, although the debate around its success (see Palmer 2003), summarised in Chapter 1, indicates that (as with any other method of testing for psi) it cannot yet be considered as providing a reliable and valid demonstration of ESP. At the time of his first review and meta-analysis, Hyman (1985: 4) considered ganzfeld research to be the most promising in parapsychology, and although he identified a number of flaws, several more recent series of well-controlled studies with good sample sizes (e.g. Bem & Honorton 1994, Dalton 1997, Parker 2000) have produced significantly above-MCE scoring. Parker (2000: 1) noted that ganzfeld research had "attained something of the status of a flagship in parapsychology, being frequently cited by parapsychologists as a replicable technique"; it continues to be used in

contemporary studies (e.g. Marcusson-Clavertz & Cardeña 2011, Parker 2010, Roe, Cooper & Martin 2010), and more recent meta-analyses continue to suggest success of the technique (e.g. Storm *et al*. 2010), although these have also been subject to criticism (e.g. Hyman 2010). In addition it is notable that, in response to critiques of parapsychology by Hyman (2009) and Wiseman (2009), Roe (2009: 24) chooses to cite ganzfeld research as being demonstrable of a replicable effect. It is thus clear that, although not without controversy, the ganzfeld technique satisfies Wiseman's (2009: 21) request for studies to be conducted using procedures that have already been identified as yielding the most promising results; it is also a relatively inexpensive and less time-consuming procedure compared to dream and remote viewing studies.

The present study therefore used typical ganzfeld free-response methodology, involving the receiver placing translucent hemispheres over their eyes, viewing a red light, and undergoing a short relaxation procedure before listening to continuous pink noise. During this period senders viewed a randomly selected picture postcard with the intention that the contents of the picture would become apparent to the receiver in their imagery and impressions. The receiver was subsequently shown four pictures, of which one was the target picture, and was asked to rank them in order of their similarity to their impressions during the trial. The use of these rankings to assess success is discussed in the next section.

5.1.2.3. Assessment of Direct and Binary Hits

The assessment of success in ganzfeld research has commonly been performed using direct hits, where the receiver or judge ranks the target as having the closest

resemblance to the receiver's impressions during the trial, compared to the decoys (Honorton 1985: 54). At the time of his meta-analysis, Honorton (1985: 54) reported that direct hits were the most prevalent index of success in ganzfeld research, and therefore performed his analysis using only studies that reported this measure; more recent studies (e.g. Bem & Honorton 1994, Dalton 1997, Marcusson-Clavertz & Cardeña 2011, Parker 2000, Parker 2010, Roe *et al*. 2010) have continued to report direct hits, and the present study therefore maintained this convention to allow a straightforward comparison of success with previous research.

An alternative index of success is the binary hit, as used in the Maimonides dream ESP studies (Ullman *et al*. 1973, Sherwood & Roe 2003: 87). For this measure, a hit is denoted as the target being ranked in the top half of the allocated ranks (Honorton 1985: 54); for example, if four stimuli are ranked, a binary hit is counted if the target is allocated a rank of either 1 or 2. This measure has the advantage of being less conservative than the assessment of direct hits (Honorton 1985: 54), as it allows for instances in which the receiver's impressions correspond strongly with two potential targets. Binary hits are therefore a useful additional index of success, but analysing direct and binary hits may lead to statistical issues since any analysis of the latter must by definition include the former. However, in their joint communiqué recommending improvements in methodology for future ganzfeld studies, Hyman and Honorton (1986: 358) suggested that statistical power may be usefully increased by using two or more indices of success, such as direct and binary hits, provided that an appropriate adjustment is made (such as a Bonferroni correction) to ensure the overall error rate remains within acceptable limits. Binary hits were therefore examined in this study as an additional index of success.

5.1.2.4. Independent Judging

As in the present study, the majority of ganzfeld studies have used receivers' target rankings to assess success (e.g. Bem & Honorton 1994, Dalton 1997, Marcusson-Clavertz & Cardeña 2011, Parker 2000, Parker 2010). Other studies, such as the Maimonides dream ESP studies (Ullman *et al*. 1973) and a recent ganzfeld study by Roe *et al*. (2010), have used one or more independent judges to provide rankings, either in addition to, or in preference to, the rankings of the receiver; few researchers provide justifications for their decisions in this respect, while Hyman and Honorton (1986) did not make any recommendations as to which may be superior.

In some instances, independent judging may be preferable to receiver judging; for example, if a study has inadequate controls for sensory leakage, the receiver's experimenter may be aware of the target and may therefore subconsciously influence the receiver to rank that target highest during judging. However, if the receiver's mentation is recorded before any of this influence occurs, and is sent to an independent judge who is also free from experimenter influence, then a more objective set of ranks may be obtained. However, in a well-controlled study this issue would not be present, although the use of independent judging may still lend an air of verification to the research, by demonstrating that overall above-MCE scoring (where it occurs) is based on the observations of an independent observer rather than solely by the participants themselves. Of course, where receiver judging and independent judging are used in the same study, one must be wary of inflating error rates due to multiple analyses.

In other instances, receiver judging may be preferable to independent judging. As discussed earlier relating to the remote viewing research of Targ and Puthoff (1977), the use of independent judging can lead to error, although the criticisms surrounding these researchers' studies (e.g. Marks 2000: 45-69) relate more to the use of a single receiver for multiple targets, and inadequate editing of transcripts, rather than independent judging itself. A more basic advantage of receiver judging is that a transcript or recording of their impressions can never entirely capture their full experience, be this visual or otherwise, meaning that an independent judge inevitably has a slightly incomplete description upon which to base their judgements. Similarly, Ullman *et al*. (1973: 90) noted that participants in their dream ESP studies would often remark that a target reminded them of their dreams without being able to specify which particular aspect did so.

Receiver judging was therefore used in the present study, due to these advantages and to its prevalence in previous ganzfeld studies. However, in addition to obtaining the receivers' rankings, the receivers' reports of their impressions were also given to three independent judges, who performed the same ranking process for each trial in the study. It was intended that receiver judging would be used as the main basis for assessing ESP task success, but that independent judging would allow some comparison, for example to identify whether there were any notable differences in scoring between these measures. Another reason for including independent judging was that this would allow some assessment of the agreement over the assigned rankings; for example, while some receivers may fortuitously score a direct hit despite having very wide-ranging or minimal impressions that do not correspond particularly well with either the target or the decoys, other receivers may provide very detailed

accounts that allow them, and the judges, to easily rank the target in 1st place. Although ESP cannot be definitively determined to have occurred in any individual trial, trials in which there is complete and correct agreement over the target may tentatively suggest this possibility, and are worth examining in more detail.

5.1.2.5. Other Methodological Features

In addition to the points raised so far, several other methodological features are worthy of note. In accordance with the recommendations of Hyman and Honorton (1986: 355-362), the possibility of sensory leakage was eliminated by ensuring that the sender and receiver were in separate rooms and monitored by experimenters, and by using duplicate target pictures to prevent cues due to handling of the picture by the sender. Targets and decoys were selected, and ordered for judging, by a computerised pseudo-random number generator; this was checked for randomness, and the randomisation procedure was carried out by an individual who was otherwise uninvolved with the study. All main statistical analyses were planned before the study took place, with any post hoc analyses clearly indicated, and corrections were applied where necessary to control for the conducting of multiple analyses.

5.1.2.6. Participant Selection

A final note concerns the selection of participants. One of the objectives of J. B. Rhine's original programme of forced-choice Zener card research was to demonstrate that psychic ability was widespread, and not confined to "exceptional beings" (Beloff 1993: 127); however, Rhine (1948a cited in Beloff 1993: 270) also considered it

likely that individuals would differ greatly in their actual or potential ability. Both of these suggestions appear sound. For example, surveys have found ESP-type experiences to be reported by approximately 40-50% of respondents (Palmer 1979: 258, Parra & Paul 2010: 150); as discussed earlier in the thesis, one cannot be certain that any of these experiences involve ESP, but the prevalence of these reports suggests that, if ESP is a genuine phenomenon, it is not limited to a small number of individuals. If this assumption holds, it would seem likely that there will be a continuum of ESP ability, as with any other human ability or trait.

Given the potential for individuals to vary in ESP ability, one may expect that it would be advantageous to seek out those whose ability is the strongest, to provide a convincing demonstration of ESP. To this end, while one of Rhine's overall objectives for his programme of research was to demonstrate the universality of psychic ability, one of his objectives for his early tests was to specifically identify consistently high scorers (Rhine 1934/1964: 47); as discussed in Chapter 1, these included participants such as Adam Linzmayer and Hubert Pearce (Rhine 1934/1964: 86, 113). However, participants who wish to demonstrate their high level of ESP ability may be more motivated to cheat, and the requirement for repeated testing allows them more opportunity to discover ways in which to do this (Irwin & Watt 2007: 63, Milton & Wiseman 1997: 29-31).

In addition to a lower likelihood of cheating, the use of 'unselected' participants has the advantage of allowing more effective testing of correlates of ESP task success; this may allow a far more in-depth examination of factors that are related to ESP ability, rather than solely demonstrating the existence of ESP with a small number of

participants. A potential disadvantage is that unselected participants may be expected to obtain lower ESP scores than participants who are selected based on a purportedly psi-conducive trait or on their own self-proclaimed ability (Irwin & Watt 2007: 63); however, this by no means guarantees failure. For example, while Bem and Honorton (1994: 11) found that a sample of artistically gifted participants obtained the highest hit-rate in the Psychophysical Research Laboratories (PRL) studies, novice participants scored significantly above MCE, and their scoring was not significantly different from participants who had experience with the ganzfeld procedure. Given that the present study aimed to examine correlates of ESP task success, and that the researcher did not have access to an easily-identifiable pool of participants with purportedly psi-conducive traits, unselected participants were therefore obtained with the confidence that they would be able to demonstrate ESP.

5.1.3. Hypotheses

A series of hypotheses were made, as follows:

- It was hypothesised that the target picture would be ranked 1st (a 'direct hit') significantly more often than mean chance expectation (MCE, 25%), and likewise that the target picture would be ranked 1st or 2nd (a 'binary hit') significantly more often than MCE (50%).
- It was hypothesised that non-stranger pairings would score significantly more highly in terms of target rankings (i.e. a lower number) than stranger pairings.
- For non-stranger pairings, negative relationships were hypothesised between the ranking given to the target and i) the receiver's QECR score, ii) the sender's

QECR score and iii) the mean QECR score of the pairing, such that rankings would generally be higher (a lower number) for the more closely connected pairings. In line with Schouten's (1983: 332) suggestion that the probability of becoming the percipient in a spontaneous case is higher for the individual who is more emotionally dependent on the other person, it was hypothesised that the relationship between the target ranking and the receiver's QECR score (i.e. measuring how close the receiver felt to the sender) would be stronger than the relationship between the target ranking and the sender's QECR score (i.e. measuring how close the sender felt to the receiver).

- In line with the findings of Dalton (1994) and Hume (2003) it was hypothesised that mixed-sex pairings would perform better than same-sex pairings, but that this would be primarily due to better performance by romantic couples.

5.2. Method

5.2.1. Design

The study used a mixed design since examination was made of the hit-rate across all participants, differences between groups, and relationships between variables. The first independent variable was the sender-receiver relationship category, which had 4 levels: stranger, friend, family and romantic. The second independent variable was the sex pairing, which also had 4 levels: male sender-male receiver, male-female, female-male and female-female. The rank (1 to 4) assigned to the target was the dependent variable, with a rank of 1 designated as a 'direct hit' and a rank of 1 or 2 designated as a 'binary hit'. This rank was also used as a variable in correlation analyses, along with

the sender's QECR score, the receiver's QECR score, and the mean QECR score of the pairing, as measures of relationship closeness (for non-stranger pairings only).

5.2.2. Participants

Ethical approval was obtained from the Coventry University Ethics Committee (see Appendix A) before the study began and before any potential participants were contacted. Participants were an opportunity sample of volunteers, consisting of psychology students and staff from Coventry University as well as some of their friends or family members who were brought as testing partners. These participants were obtained through poster advertisements in the University's psychology department, a listing on the students' research participation website, and by word of mouth. Most of the psychology students took part for research participation credit, whilst the other participants took part out of their own interest.

The sample consisted of 60 participants (30 pairings) in total. There were 18 males and 42 females, ranging in age from 18 to 52 years (mean = 22.86, SD = 7.85). One participant did not provide their age. The pairs consisted of 3 all-male pairings, 15 all-female pairings and 12 mixed-sex pairings. Four pairings were strangers, 18 pairings were friends, 2 pairings were siblings (one of them dizygotic twins) and 6 pairings were romantic partners.

5.2.3. Materials

Twenty-three of the thirty pairings were tested in the main ganzfeld testing rooms in the James Starley (JS) building in Coventry University. These consisted of two separate rooms, which were approximately 10 metres away from each other and on opposite sides of a corridor in the basement of the building. The room housing the receiver consisted of two sections that were separated by a wall with a sliding door, allowing the receiver to be seated in one section while an experimenter resided in the other. The room housing the sender was a normal room with no such separation.

Building work prevented access to these main rooms for a two-month period, so alternative rooms in the University's Charles Ward (CW) building were used. The room used was on the ground floor and consisted of a main room with four separate rooms (A-D) connected to it. The receiver was based in room A, and the sender in room C, with room B separating them by a distance of approximately 5 metres.

Tests were carried out regarding the acoustic isolation of the rooms. This involved one experimenter calling out in a loud voice from the sender's room, whilst another experimenter attempted to hear this call from the receiver's room. The JS rooms passed this test as the call could not be heard. The CW rooms, due to the closer proximity of the sender and receiver, was less satisfactory in this regard since loud calling could be heard in the receiver's room. Nevertheless, normal conversation-level sounds could not be heard, and loud calls were rendered impossible by the constant presence of two experimenters.

Forty colour picture postcards were used as targets. These were pre-arranged into 10 sets of 4 cards such that no two cards in the same set contained similar images (see appendix I). There were two copies of these postcards, one set for use by the sender, and the other for use by the receiver when making their rankings based on their impressions; this prevented any kind of sensory leakage due to marks left on the cards during the sending process.

A custom-built software program was used as a pseudo-random number generator (PRNG). The PRNG was used to select the set (1 to 10) and the picture (A to D) for the trials, as well as the order in which to arrange the pictures during judging, to control for position effects; different orders were created for the participant and each of the three independent judges. If the PRNG selected the same set for both trials of a pairing, the randomisation was run again to ensure a different set was used for the second trial. The details for the trials were printed and placed in sealed, opaque numbered envelopes. For the sender, the details given were the set and the target picture on which to focus. For the receiver, the details given were the set and the picture arrangement order for judging. Randomisation was carried out by a member of University staff who was otherwise uninvolved in the study.

The sender was provided with plain paper and coloured pencils so that they could draw a copy of the target picture, to prevent boredom and to assist them in engaging with the material. The ganzfeld environment made use of a comfortable, reclining chair, placed in a dark room. A lamp containing a red light bulb was shone towards the receiver, from approximately 40cm in front of their face. An Apple iPod Nano (2nd generation) was used to play a short progressive relaxation procedure (see

Appendix G) of 5 minutes and 30 seconds, followed immediately by 30 minutes of pink noise, to the receiver through headphones. If permitted by the participants, translucent hemispheres (half ping-pong balls) were placed over their eyes and affixed with tape. Two Binatone Terrain 150 walkie-talkies were used for communication between the experimenters in the two rooms, and an Olympus VN-3500PC digital voice recorder was used following the trial to record the receiver's description of the impressions they had experienced whilst in the ganzfeld environment.

A slightly modified version of the Questionnaire of Emotional Connectedness in Relationships, or QECR (Schmidt *et al*. 2001; see Appendix F) was used to measure the closeness of the relationship between the sender and receiver for non-stranger pairings. This questionnaire firstly asked the respondent to state their relationship with the other participant (e.g. parent, sibling, friend etc.), and then to estimate how close their relationship was on a scale from 0 to 10. (The original version used a scale from 0 to 100, but it was decided that a 0 to 10 scale was sufficient; however, it was later determined that this measure was superfluous and it was not used in analysis). The questionnaire then presented the participant with 27 items regarding their relationship with their experimental partner; 18 of these were positively worded (e.g. "in this relationship, we exchange thoughts freely"), while 9 were negatively worded, (e.g. "in this relationship, we both have little understanding and respect for each other"). Participants responded using a 6-point Likert scale, ranging from 'never applies' to 'applies completely', although a 'not applicable' option was also available. Participants were then asked to re-evaluate their relationship on the 0 to 10 scale, in light of their responses to the main scale items (as stated above, though, this measure was later considered superfluous and was not used in analysis). Each item was scored

from 0 to 5, with higher scores indicating a closer relationship. The overall score was then calculated as a percentage, omitting any items for which 'not applicable' was selected. The scale has been shown to have good internal consistency (α = .93; Schmidt *et al.* 2001).

5.2.4. Procedure

Participants were given a thorough description of what would occur during the study, both in writing (see Appendix E) and verbally, allowing them to give fully informed consent. They were also told that they had the right to withdraw from the study at any time. When they were ready to proceed, the participants decided which members of the pairing would be the sender and receiver for the first trial. They were then taken to the appropriate rooms, each supervised by a researcher. The author was present at each trial, accompanied by a second, female researcher.

The receiver was then set up in the ganzfeld environment. The comfortable chair, red lamp and headphones were mandatory, but the receiver was given the choice of whether or not to use the translucent hemispheres; 19 participants declined due to finding them unpleasant to wear, and chose to close their eyes instead. The receiver was asked to relax and let any images, thoughts, feelings or emotions come to them during the trial. Whilst the receiver was being set up, for non-stranger pairings the sender was asked to complete the QECR, whilst for stranger pairings the sender was asked to wait for a few minutes while the receiver was being prepared.

When the receiver was ready, a signal was sent to the sender's experimenter, using the walkie-talkies; this was a beeping tone that ensured the experimenters did not need to speak to one another once the trial had begun, thus eliminating sensory leakage via this channel. The iPod relaxation procedure was started, and the receiver was left alone to relax. In the JS rooms the receiver's experimenter retired to their section of the two-part room, whereas in the CW rooms they retired to a position in the main room. The sender's experimenter opened the envelope containing the target details, selected the target picture, and gave it to the sender to begin focussing on and/or drawing it; the sender was asked to use any technique they wished in order to attempt to 'send' the contents of the picture to the receiver. This continued for 35 minutes and 30 seconds in total, covering the whole of the relaxation procedure and pink noise period.

At the end of the trial, another walkie-talkie signal was sent by the receiver's experimenter to the sender's experimenter to inform them that the sending period was over. The receiver was brought out of the ganzfeld environment, and was asked to describe all of their impressions during the trial. This was recorded on the voice recorder for use in later independent judging. The receiver's experimenter then opened the envelope containing the target set details, and arranged the four pictures from the set into the order chosen by the PRNG. The pictures were arranged in a 2x2 formation in order to control for position effects as much as possible. The receiver was asked to rank the pictures in order of how well they represented their imagery, thoughts, feelings and emotions during the trial. Once this process was complete, a final walkie-talkie signal was sent by the receiver's experimenter to the sender's experimenter to denote the end of the trial, and the researchers and participants

convened to discover the true identity of the target. Participants were allowed a short break if they desired, following which they swapped sender/receiver roles, and the whole procedure was repeated. After the second trial the participants were given a thorough debriefing and thanked for their participation.

Following the completion of the testing of all 30 pairings, the judging of the similarity of the receivers' mentation to the targets and decoys was repeated for all 60 trials by three independent judges, using the recordings obtained from the voice recorder. These judges were not otherwise involved in the study, and had no contact with each other during the judging period.

5.3. Results

5.3.1. Randomisation Checks

A number of randomisation checks were performed, and no problems were demonstrated in this respect. No sets (1-10) were selected significantly more often than the others (χ^2 (9, N = 60) = 5.00, p = .834), no targets (A-D) were selected significantly more often than the others (χ^2 (3, N = 60) = 2.67, p = .446), and there was no tendency for a specific target to be selected more often within a set (Fisher's exact test, p = .310). To check that there were no patterns in the sequence of targets, it was examined whether there was a tendency for a particular target to follow another target, for example if target B was more often followed by target C, irrespective of the set; no such sequences were found (Fisher's exact test, p = .380). This analysis could not be performed to examine any sequence of sets, due to the small numbers involved;

there were 100 possible permutations of sequential sets, but only 60 trials. However, inspection of the data revealed no concerns.

The target was not in any positions for judging more often than the others, for receivers or judges (receiver: χ^2 (3, N = 60) = 5.73, p = .125; judge 1: χ^2 (3, N = 60) = 2.80, p = .423; judge 2: χ^2 (3, N = 60) = 3.60, p = .308; judge 3: χ^2 (3, N = 60) = 1.60, p = .659), and receivers and judges showed no bias towards any positions while judging (receiver: χ^2 (3, N = 60) = 3.60, p = .308; judge 1: χ^2 (3, N = 60) = 0.13, p = .988; judge 2: χ^2 (3, N = 60) = 2.40, p = .494; judge 3: χ^2 (3, N = 60) = 2.80, p = .423). There was no tendency for a particular target position to follow another target position, for receivers or judges (Fisher's exact test; receiver: p = .883; judge 1: p = .371; judge 2: p = .151; judge 3: p = .448).

5.3.2. Receiver Judging: Planned Analyses

The following analyses regarding the receivers' judging of their own trials were planned in advance of the trials taking place, to avoid the problem of using multiple analyses or multiple indices of success until a significant result was found. All p-values presented are two-tailed.

Due to the use of rank data, and the non-independence of scores owing to participants all taking part in two trials, all analyses conducted were non-parametric. Medians and interquartile ranges are therefore presented, as is custom with non-parametric analyses, but the small range of ranks assigned to targets has in some instances led to identical medians despite some apparent differences between the groups in terms of

hit-rates. The means and standard deviations are therefore also reported as these provide indications of slightly more subtle differences between groups.

For analyses of direct hits and binary hits a Bonferroni correction was applied due to the use of two indices of success, as per the recommendations of Hyman and Honorton (1986: 358); the alpha level was therefore adjusted to .025 to account for the conducting of two similar analyses (Field 2013: 69). There were 20 direct hits from the 60 trials, a hit-rate of 33.33%. This was above the MCE of 15 hits, but not significant: $z = 1.52$, $p = .128$, $\pi = .600$. There were 38 binary hits, a hit-rate of 63.33%. This was above the MCE of 30 hits but was marginally non-significant at the corrected alpha level: $z = 2.14$, $p = .032$, $\pi = .633$.

The results split by sex pairing are shown in Table 5.1. Female sender-male receiver pairings performed best with regard to direct hits, binary hits and mean target rank, while male-male pairings generally performed least well. However, the medians were identical for all four pairing types, and a Kruskal-Wallis test showed there to be no significant difference between the pairing types in terms of the ranking given to the target: $H = 0.992$, $df = 3$, $p = .803$, $\eta^2 = .017$. Although the group sizes were rather unbalanced, the number of trials in each group was greater than 5, meaning that the Kruskal-Wallis test should not be adversely affected (McDonald 2013); however, a larger number of male-male pairings would have been desirable to give a potentially more representative set of results for this type of pairing, and so their relatively poor performance should be interpreted with caution.

Table 5.1. Direct hits, binary hits, median target rank and mean target rank, split by sex pairing (receiver judging).

Sender Sex	Receiver Sex	Trials	Direct Hits	Direct Hit-Rate (%)	Binary Hits	Binary Hit-Rate (%)	Median Target Rank (IQR)	Mean Target Rank (SD)
Female	Male	12	5	41.67	9	75.00	2.0 (2.0)	2.00 (1.13)
Male	Female	12	3	25.00	8	66.67	2.0 (3.0)	2.33 (1.16)
Female	Female	30	12	40.00	17	56.67	2.0 (2.0)	2.20 (1.16)
Male	Male	6	0	0.00	4	66.67	2.0 (1.0)	2.33 (0.52)

The results split by categorised sender-receiver relationship are shown in Table 5.2. Romantic pairings performed best with regard to direct hits, binary hits and mean target rank; they were equal to friend pairings with regard to median target rank, although with a smaller interquartile range. Sibling pairings performed least well on all indices of success. A Kruskal-Wallis test showed there to be no significant difference between the relationship categories in terms of the ranking given to the target: $H = 4.689$, $df = 3$, $p = .196$, $\eta^2 = .079$. However, in this instance, the number of trials involving siblings was below 5, suggesting that the results for this type of pairing may not be representative of sibling performance, but also violating the sample size requirement for the Kruskal-Wallis test (McDonald 2013). As a precautionary measure, the test was therefore performed whilst excluding the sibling pairings, to examine any differences between the three other types of pairing; the result remained non-significant: $H = 1.991$, $df = 2$, $p = .370$, $\eta^2 = .036$.

Table 5.2. Direct hits, binary hits, median target rank and mean target rank, split by sender-receiver relationship category (receiver judging).

Relationship Category	Trials	Direct Hits	Direct Hit-Rate (%)	Binary Hits	Binary Hit-Rate (%)	Median Target Rank (IQR)	Mean Target Rank (SD)
Romantic	12	5	41.67	11	91.67	2.0 (1.0)	1.75 (0.87)
Sibling	4	0	0.00	1	25.00	3.0 (2.0)	3.00 (0.82)
Friend	36	12	33.33	22	61.11	2.0 (2.0)	2.19 (1.06)
Stranger	8	3	37.50	4	50.00	2.5 (3.0)	2.50 (1.41)

For analyses of QECR scores the alpha level was adjusted to .017 using a Bonferroni correction, to account for the conducting of three similar analyses. Individual QECR scores of the 52 non-stranger participants ranged from 48.70 to 95.56 (mean = 76.17, SD = 9.99). Mean QECR scores of the 26 pairings ranged from 56.57 to 89.79 (mean = 76.17, SD = 8.58). Kendall's tau correlation analysis was performed to examine the relationship between the ranking given to the target and the receiver's QECR score (i.e. the strength of the receiver's closeness to the sender); the relationship was weak, negative and non-significant: τ = -.133, N = 52, p = .215. The relationship between the ranking given to the target and the sender's QECR score (i.e. the strength of the sender's closeness to the receiver) was very weak, negative and non-significant: τ = -.079, N = 52, p = .462. The relationship between the ranking given to the target and the mean QECR score of the pairing (i.e. the overall closeness of the pairing) was very weak, negative and non-significant: τ = -.098, N = 52, p = .359. All of these analyses therefore demonstrated that closer bonding corresponded with better performance, but to a weak and non-significant degree. The relationship between the ranking given to the target and the receiver-to-sender bond was stronger than the relationship between the ranking given to the target and the sender-to-receiver bond,

as hypothesised, but the difference between the relationships was not significant: $t_{obt}(49) = 0.32$, $p = .750$.

5.3.3. Receiver Judging: Post Hoc Analysis

Two items of post hoc analysis were performed. Firstly, it was necessary to check that using different laboratory rooms for some trials did not affect the results. Participants performed better overall in the JS rooms (median target rank = 2.0, IQR = 2.0, mean = 2.09, SD = 1.05) than the CW rooms (median target rank = 2.5, IQR = 2.0, mean = 2.57, SD = 1.16), but a Mann-Whitney U test demonstrated that the difference was not significant: U ($N_1 = 46$, $N_2 = 14$) = 244, $p = .156$, $r = .183$. Secondly, it was examined whether there was any difference between the results of participants who used the hemispheres and those who declined them. Participants who did not use the hemispheres performed slightly better (median target rank = 2.0, IQR = 2.0, mean = 2.00, SD = 1.11) than participants who used them (median target rank = 2.0, IQR = 2.0, mean = 2.29, SD = 1.08) but a Mann-Whitney U test demonstrated that the difference was not significant: U ($N_1 = 19$, $N_2 = 41$) = 326.5, $p = .298$, $r = .135$.

5.3.4. Independent Judging

Direct hits, binary hits, median target rank and mean target rank for each independent judge are shown in Table 5.3, along with the receiver results for comparison. Although exact scoring differed, all three judges scored above MCE for both direct and binary hits. Scoring of judges 1 and 3 was not significant, while judge 2 scored significantly for binary hits.

Table 5.3. Direct hits, binary hits, median target rank and mean target rank for receiver and independent judges.

Judge	Direct Hits (Rate/%)	Binary Hits (Rate/%)	Median Target Rank (IQR)	Mean Target Rank (SD)
Receiver	20 (33.33)	38 (63.33)	2.0 (2.0)	2.20 (1.09)
Judge 1	17 (28.33)	32 (53.33)	2.0 (2.0)	2.38 (1.11)
Judge 2	21 (35.00)	40 (66.67)**	2.0 (2.0)	2.13 (1.07)
Judge 3	21 (35.00)	31 (51.67)	2.0 (2.0)	2.37 (1.19)

Key: Asterisked values indicate hit-rates significantly above MCE with two-tailed tests (* $p < .025$, ** $p < .01$, *** $p < .001$).

Direct hits and binary hits for each independent judge, split by sex pairing, are shown in Table 5.4, along with the receiver results for comparison. Judges' results did not compare especially well to receivers' results; in particular, the relative overall success of female sender-male receiver pairings and the poor direct hitting rate of male-male pairings were not seen in the judges' ratings. The only consistent results from the receivers and all three judges were the above-MCE direct hitting of female-female pairings and the above-MCE binary hitting of male-male pairings.

Direct hits and binary hits for each independent judge, split by sender-receiver relationship category, are shown in Table 5.5, along with the receiver results for comparison. As with the sex pairing findings, judges' results did not compare especially well to receivers' results; in particular, the relative overall success of romantic pairings and the relative overall lack of success of sibling pairings were not seen in the judges' ratings. The only consistent results from the receivers and all three judges were the above-MCE direct hitting and binary hitting of friend pairings.

Table 5.4. Direct hits and binary hits for receiver and independent judges, split by sex pairing.

Sender Sex	Receiver Sex	Trials	Receiver Direct Hits (Rate/%)	Judge 1 Direct Hits (Rate/%)	Judge 2 Direct Hits (Rate/%)	Judge 3 Direct Hits (Rate/%)	Receiver Binary Hits (Rate/%)	Judge 1 Binary Hits (Rate/%)	Judge 2 Binary Hits (Rate/%)	Judge 3 Binary Hits (Rate/%)
Female	Male	12	5 (41.67)	2 (16.67)	2 (16.67)	3 (25.00)	9 (75.00)	6 (50.00)	7 (58.33)	4 (33.33)
Male	Female	12	3 (25.00)	2 (16.67)	5 (41.67)	2 (16.67)	8 (66.67)	6 (50.00)	8 (66.67)	4 (33.33)
Female	Female	30	12 (40.00)	10 (33.33)	12 (40.00)	14 (46.67)**	17 (56.67)	15 (50.00)	21 (70.00)*	18 (60.00)
Male	Male	6	0 (0.00)	3 (50.00)	2 (33.33)	2 (33.33)	4 (66.67)	5 (83.33)	4 (66.67)	5 (83.33)

Table 5.5. Direct hits and binary hits for receiver and independent judges, split by sender-receiver relationship category.

Relationship Category	Trials	Receiver Direct Hits (Rate/%)	Judge 1 Direct Hits (Rate/%)	Judge 2 Direct Hits (Rate/%)	Judge 3 Direct Hits (Rate/%)	Receiver Binary Hits (Rate/%)	Judge 1 Binary Hits (Rate/%)	Judge 2 Binary Hits (Rate/%)	Judge 3 Binary Hits (Rate/%)
Romantic	12	5 (41.67)	1 (8.33)	4 (33.33)	3 (25.00)	11 (91.67)***	6 (50.00)	6 (50.00)	5 (41.67)
Sibling	4	0 (0.00)	1 (25.00)	2 (50.00)	0 (0.00)	1 (25.00)	2 (50.00)	3 (75.00)	2 (50.00)
Friend	36	12 (33.33)	12 (33.33)	14 (38.89)	15 (41.67)*	22 (61.11)	20 (55.56)	27 (75.00)***	21 (58.33)
Stranger	8	3 (37.50)	3 (37.50)	1 (12.50)	3 (37.50)	4 (50.00)	4 (50.00)	4 (50.00)	3 (37.50)

Key: Asterisked values indicate hit-rates significantly above MCE with two-tailed tests (* $p < .025$, ** $p < .01$, *** $p < .001$).

To obtain a more objective measure of receiver and judge agreement, intraclass correlations were calculated. Agreement between the three judges was shown to be significant and moderate (intraclass r = .452, $F(59, 118) = 3.508$, $p < .001$), whilst including the receiver along with the judges lowered the strength of agreement slightly (intraclass r = .409, $F(59, 177) = 3.779$, $p < .001$). It therefore appears that receivers and judges were agreeing to a reasonable degree, but areas of disagreement have clearly had a fairly large impact on the results in terms of the apparent relative performance of the different subgroups of participants.

5.3.5. Notable Hits and Notable Misses

The use of independent judges allowed examination of what may be termed 'notable hits'; these are trials in which the receiver and all three independent judges ranked the target in first position and therefore scored a direct hit, indicating a strong correspondence between the receiver's impressions and the target picture, relative to the decoys. There were four such notable hits, one of which is described below, with the remainder presented in Appendix H (target and decoy pictures are included in Appendix I). Note that the mentation summaries are edited slightly to enhance readability, but all of the key features are retained.

Notable hit 1 (trial 2, female-female, friends, mean QECR score 72.83, set 6, target A): "I kept seeing doorways and things like bowls, like a kind of oval-shaped sort of doorway. I kept seeing the colour green and shades of grey."

This was a very clear match to the target, which contains a prominent doorway with numerous bowls in the foreground.

The use of independent judges also allowed examination of what may be termed 'notable misses'; these are trials in which the receiver and all three independent judges ranked a particular decoy in first position, indicating a strong correspondence between the receiver's impressions and this decoy, relative to the actual target and the other two decoys. There were three such notable misses, one of which is described below, with the remainder presented in Appendix H.

Notable miss 1 (trial 23, female-female, friends, mean QECR 72.37, set 1, target A, decoy D chosen): "I saw a stick man, but I didn't really feel anything. I also saw a dog. The stick man was green, and the dog was white and brown and fluffy."

This brief description does not resemble the target, but the mention of a man matches the selected decoy, despite the fact that he is not a stick man and a dog is not present.

5.4. Discussion

5.4.1. Summary and Interpretation of Results

The key results from this study were all non-significant; the hypotheses were therefore not supported, and no firm evidence for ESP was obtained. Nevertheless, it is notable that many of the results were in the hypothesised directions. For receiver judging, direct hitting was above MCE, as was binary hitting. The direct hit-rate of

33.33% was very similar to that of previous ganzfeld research, including the pre-PRL database (33%; Bem 1994: 25) and the PRL studies (32%; Bem & Honorton 1994), and provided an almost identical effect size to the latter (π = .60; PRL: π = .59). Although this result did not reach significance, similarity in effect size across studies has been argued to be of potential importance in demonstrating a replicable effect, even with non-significant results (e.g. Hubbard & Lindsay 2008: 81). Therefore, although non-significant, this result remains of interest and suggests that the ESP hypothesis should not be completely disregarded. Binary hitting was marginally non-significant after correcting for multiple analyses, so no evidence for ESP can be claimed based on this less conservative measure of success, although again, the near-significance of the result suggests it remains of interest; for example, it may be that the sample size was insufficient to allow significance to be reached.

Analyses of the sender-receiver relationship suggested an advantage for romantic pairings and pairings with higher mean self-reported connectedness to each other; these results were thus in the hypothesised directions and also mirrored those of previous researchers (e.g. Broughton & Alexander 1997, Dalton 1997) who found that emotionally closer pairings scored more highly. However, these results were not significant, and the correlation between the receiver's target ranking and the mean QECR score of the pairing was very weak. In line with Schouten's (1983: 332) suggestion that the probability of becoming the percipient in a spontaneous case is higher for the individual who is more emotionally dependent on the other person, the relationship between the target ranking and the receiver-to-sender bond was slightly stronger than the relationship between the target ranking and the sender-to-receiver bond; again, though, the correlations were weak and the results were not significant.

In terms of sex pairing, highest scoring was obtained for female sender-male receiver pairings and lowest scoring was obtained for male-male pairings; this advantage for mixed-sex pairings was also as hypothesised and corresponds with the findings of Dalton (1994) and Hume (2003). As suggested by Hume (2003: 148), this appeared to be due to the tendency for higher scoring in the romantic pairings, suggesting that apparent findings of sex pairing differences in other studies may be artefacts due to relationship differences. However, again these results were not significant, meaning that any interpretation must remain speculative.

Results varied somewhat across the three independent judges, but analysis of overall inter-rater reliability demonstrated a significant, moderate intraclass correlation, and direct hitting and binary hitting were above MCE for all three judges. The advantage for romantic pairings was not apparent with any of these judges; in fact friend pairings appeared to be judged as the most successful overall. Similarly, for sex pairing the female-female pairings tended be judged as scoring the highest numbers of hits. Therefore, although there was significant agreement between the judges, and between the judges and the receivers, there was sufficient disagreement to lead to differences in the apparent relative performance of the subgroups of participants. Along with the non-significant results from receivers' target rankings, this disagreement would seem to emphasise the lack of support for any clear effects of sender-receiver relationship or sex pairing upon task success. However, a consistent result from the receivers and judges was the above-MCE direct and binary hitting; as with the receivers' non-significant results for these measures, this consistency cannot be interpreted as evidence for ESP, but it may be considered as a finding of interest that at least renders the ESP hypothesis worthy of additional study.

The use of independent judges allowed analysis of notable hits and misses, which produced some intriguing findings. Researchers may often report notable hits (e.g. Honorton *et al*. 1990: 120-126) but it is rare to find reporting of notable misses; however, reporting such misses lends balance to the analysis and allows some estimation of the likelihood that the notable hits were due to chance alone. Of the four notable hits, one experience was a very clear match to the target, two contained a number of different aspects but were very much more related to the target than the decoys, and one appeared to be rated as a hit largely due to a fortuitous connection between the water-like sound of the pink noise and the content of the target. Given the hypotheses of greater success in mixed-sex pairings with close relationships, it is of interest that all four notable hits were from female-female pairings of friends, only one of which had a mean QECR score above the overall mean (these ranged from 69.31 to 80.74). Female-female friend trials were the most prominent, occurring in 13 of the 30 pairings, but it is noteworthy that all four of these notable hits came from these 26 trials, and also interesting that the same fairly unremarkable pairing, with the lowest mean QECR score of these four pairings, provided two of these hits. Earlier in the chapter it was argued that, although ESP cannot be definitively determined to have occurred in any individual trial, trials producing notable hits may tentatively suggest this possibility. Therefore, the pairings that obtained these notable hits are noteworthy for being particularly unremarkable in terms of their relationship closeness, further suggesting that the sender-receiver relationship may not be an important factor in ESP task success. However, it is again important to emphasise that ESP was not demonstrated to a significant level in this study, meaning that these suggestions remain speculative.

The three notable misses all contained experiences with several features to them, where some of these features corresponded more strongly with the selected decoy than the other decoys and the target. One of the pairings that obtained one of these misses was a male sender-female receiver stranger pairing, whilst the other two misses were obtained by the same female-female friend pairing with a mean QECR score (72.37) that was below the overall mean. Therefore, all but one of the notable hits and misses were from female-female friend pairings, meaning there was little apparent difference between the categories of pairings that gained these types of results. This similarity between apparently successful and unsuccessful pairings again suggests that the sender-receiver relationship and sex pairing do not appear to be important factors in ESP task success. However, given that ESP was not demonstrated to a significant level, it is also plausible that the prevalence of female-female friend pairings obtaining notable hits and misses is simply due to the predominance of this type of pairing in the study.

5.4.2. Strengths and Limitations

This study contained a number of strengths. The quantitative assessment of relationship closeness was a key feature that improved greatly upon much previous research that solely placed participants into categories, occasionally in a rather arbitrary manner. The use of the ganzfeld technique satisfied Wiseman's (2009: 21) suggestion that studies should be conducted using procedures that have been identified as yielding the most promising results, and the researcher took note of the recommendations by Hyman and Honorton (1986: 355-362) to ensure that sensory leakage was eliminated, targets were satisfactorily randomised, and statistical tests

were conducted on appropriate indices of success and with suitable corrections for multiple analyses. The use of independent judging also allowed identification of notable hits and notable misses; the former may, tentatively, allow examination of trials that are more likely to be instances of ESP, while the latter are also important to consider as they prevent researchers providing a biased impression of the overall success of a study by presenting only notable hits.

The study also contained several limitations. Although a sample size of 60 participants cannot be considered small, the fact that above-MCE direct hitting demonstrated a similar effect size to previous research but did not reach significance, whilst binary hitting was close to significance, suggests that a larger sample may have been beneficial. Furthermore, male-male and sibling pairings were underrepresented, while female-female friend pairings predominated; a more balanced composition of pairings would have been desirable.

The targets used in the present study were colour picture postcards, which had been used in ESP research by Hume (2003) that obtained some significant results. However, some studies have demonstrated that dynamic targets, such as video clips, produce higher hit-rates than static targets (e.g. Bem & Honorton 1994: 12, Sherwood & Roe 2003: 89); Watt (1989: 99) suggests that targets should be psychologically and physically salient, so the movement, complexity and life-like nature of video clips is likely to satisfy these requirements to a greater extent than static images. The use of dynamic targets may therefore be preferable to static targets.

Earlier in the chapter it was suggested that, despite the advantages of using independent judges, one may perhaps attach more meaning to the results of the receivers themselves. No matter how detailed the receiver's description of their experience, judges are somewhat disadvantaged as they rely on their own interpretation and visualisation of this description, which may be rather different to the receiver's own experience. The receiver may therefore be able to make clearer matches between the specific visual aspects of their experience and the target, as well as potentially making more personal or idiosyncratic associations of which judges would be unaware. This issue may have been further exacerbated by the specific conditions of this study regarding when and how the receiver described their experience. Palmer (2003: 54) reports that the typical ganzfeld procedure involves the receiver reporting out loud any images or impressions as they come to them during the trial. These reports are audio recorded or written down by the experimenter, who then plays or reads them back to the receiver to refresh their memory following the trial. However, this requirement for continuous verbalisation may interfere with the receiver's ability to fully relax and achieve the required altered state of consciousness, potentially making imagery or other sensations less likely to occur. Alternatively, Pütz, Gässler and Wackermann (2005: 8) suggested that continuous verbalisation may contaminate ganzfeld-induced imagery with free associations and thought fragments. These researchers therefore asked their participants to restrict their mentation reports to discrete 'chunks'; in the present study it was decided that receivers should be allowed to relax fully for the duration of the trial, and attempt to recall their impressions afterwards. Clearly, though, this procedure introduces the possibility of forgetting; indeed, in some trials certain aspects of the target or decoy pictures did appear to refresh participants' memories, leading them to provide additional

information regarding their experience that they had not reported initially. However, this additional information could not be added to the recording for the judges as this would clearly bias their judgement towards the picture that had prompted the information. It therefore seems that, in some instances, the judges were not provided with full accounts of receivers' impressions and as such they may be expected to produce differing judgements to the receivers. To improve this issue, Pütz *et al*.'s (2005) use of 'chunks' may provide a satisfactory balance between relaxation and verbalisation.

5.4.3. Future Research Directions

In general terms, future research examining the sender-receiver relationship and ESP can benefit from emulating two aspects of this study. Firstly, the relationship between two individuals in a pairing should be assessed using a measure such as the QECR, to provide a more sensitive assessment of relationship closeness and to therefore allow better examination of differences between and within pairings. Secondly, although receiver judging may be preferable to provide the key measure of task success, independent judges should be used, to allow notable hits and misses to be identified.

As discussed earlier, researchers may often report notable hits, with the implication being that these are instances of ostensible ESP. However, even the most striking of hits may be due to chance alone, and so by themselves one cannot accept such hits as evidence for ESP, no matter how remarkable the correspondence between the receiver's experience and the target. The use of independent judging adds an additional aspect to the assessment of these hits as it allows a more objective measure

of what makes a hit or miss ‘notable’. If notable hits may be considered as more likely to contain genuine instances of ESP, there is potential to identify pairings who obtain such hits and invite them to participate in more extensive testing. In addition, notable hits can be examined as a subset of hitting trials, to attempt to determine any correlates of these hits that may be used to attempt to recruit psi-conducive participants. This suggestion clearly requires a relatively large number of notable hits; given that only four were obtained in the present study, this may require collaboration of a number of research teams. It is also proposed that researchers who have published studies using several independent judges should re-examine their data for notable hits, and add these to the database.

A further consideration relates to the numbers of notable hits and misses obtained in a study. Similarly to the MCE of 25% indicating that one expects three times as many misses as direct hits, one may expect to obtain three times as many notable misses as notable hits, by chance alone. The relative number of notable hits compared to notable misses could therefore act as an additional measure of the likelihood of ESP having occurred in at least some of the hitting trials. Indeed, this measure is favourable in the present study (four notable hits compared to three notable misses), but it is acknowledged that this is very much a post hoc observation and so replication is clearly required. However, this provides another suggestion of how researchers may more usefully assess the value of notable hits rather than simply reporting them in a largely anecdotal manner. There is perhaps scope for further research into this aspect, including the development of guidelines for what can be deemed as a notable-hits-to-notable-misses ratio that indicates a statistically satisfactory level of confidence that ESP has occurred in at least one of the hitting trials.

With more specific reference to the current thesis, there is scope for a replication and extension of the present study. Although all of the key results were non-significant, many of the findings were in the hypothesised directions. In particular, direct hitting demonstrated a similar effect size to previous research, whilst binary hitting was close to significance, and there was a weak tendency for more closely bonded pairings to obtain higher scoring. These results could be interpreted either as indicative of a lack of an ESP effect and the continuation of inconsistency in this field of research, or as possibly genuine results that have not reached significance with the current sample size. In the spirit of Wiseman's (2009: 21) argument for "giving psi one last chance", a replication is required to make firm conclusions. However, this replication attempt would also benefit from some improvement and extension; as discussed earlier, a larger sample size is required, and dynamic and multisensory targets, such as video clips with sound, may produce better results than static targets (e.g. Bem & Honorton 1994: 12, Sherwood & Roe, 2003: 89). In addition, this study, as with all typical ganzfeld experiments, very much attempted to detect what Radin (2006: 98) refers to as "conscious psi", where receivers are asked to describe every image, thought or impression that they are consciously aware of during the experimental session. There is also scope to attempt to detect "unconscious psi" (Radin 2006: 131); one facet of this, namely the possibility of matching brain activity between sender and receiver, will be the topic of the next chapter.

Chapter 6

Review of Extrasensory Perception Research Using Electroencephalogram (EEG) and Functional Magnetic Resonance Imaging (fMRI)

6.1. Introduction

The previous chapter reported a ganzfeld ESP study that obtained a number of results that were in the hypothesised directions, but were not significant. Direct hitting was above MCE, with a similar hit-rate and effect size to that of previous ganzfeld research, such as the successful series of studies at the Psychophysical Research Laboratories (PRL) reported by Bem and Honorton (1994). Binary hitting was marginally non-significant after correcting for multiple analyses. There was a tendency for more closely bonded pairings to rank the target picture more highly than less closely bonded pairings, and for mixed-sex pairings to rank the target picture more highly than same-sex pairings; however, the latter result appeared to be due more to the tendency for romantically attached pairings to perform well. Thus, results appeared to be following those of spontaneous case research and the theorisation of Schouten (1983: 332), who suggested that the relationship between two people is the key aspect in determining the occurrence of an ESP experience. However, the non-significance of these results means that they may be interpreted either as indicative of a lack of an ESP effect, or as possibly genuine results that did not reach significance due to issues such as an insufficient sample size. A second study is therefore required to make firm conclusions; this will be reported in Chapter 7.

As described in Chapter 1, the ganzfeld environment was introduced into parapsychological research due to the apparent psi-conduciveness of simple relaxation (Honorton 1974: 248) and altered states of consciousness (ASCs) such as hypnosis, dreaming and meditation (Honorton & Harper 1974: 156-157). Honorton and Harper (1974) used Bertini *et al*.'s (1964) adaptation of the ganzfeld that added the playing of white noise through headphones to the standard homogeneous visual stimulation, to regulate the sensory input of participants. Honorton (1974: 250) argued that facilitation of psi reception could be achieved through a reduction in sensory input and processing; by attenuating sensory inputs and thereby reducing the number of irrelevant stimuli, relatively weak psi impressions may be more easily detected. In this way, ganzfeld stimulation creates what may be termed an "internal attention state" (Terry & Honorton 1976: 216). Bertini *et al*. (1964: 496) referred to their technique as an "experimental-hypnagogic" procedure; hypnagogia is the term for the state between being awake and falling asleep (Alvarado 2000: 193), and is known as a state in which people experience spontaneous imagery (Sherwood 2002: 127). Therefore, in addition to its potential for reducing sensory "noise", Honorton and Harper (1974: 160) considered the imagery and ideation produced by this procedure as potentially serving the role of Tyrrell's (1946: 72) "mediating vehicles" for bringing psi information into consciousness.

It therefore appears that participants, at least in laboratory studies, may need to be in a particular state in order for ESP to occur to a statistically significant level. However, even if participants are placed in a particular environment such as the ganzfeld, it is likely that different individuals will respond to the environment in different ways. Prior to Honorton and Harper's (1974) study using the ganzfeld procedure, Honorton,

Drucker and Hermon (1973) had performed a similar study using a sensory isolation cradle; participants were suspended upright in this cradle, wearing a blindfold and sound-attenuating headphones. In addition to acting as a receiver in an ESP study, at five-minute intervals participants were required to report their subjective state of mind, on a scale from zero (normally alert) to four (more or less oblivious to their external surroundings). Participants with state reports above the mean scored significantly above MCE, while participants with state reports below the mean scored non-significantly. One cannot therefore assume that a technique designed to induce a specific ASC will do so to the same level for each participant, and unexpected or inconsistent results may be due to individual differences in the technique's effects.

6.2. EEG Research: Frequency Bands and ESP Task Success

Although Honorton *et al*.'s (1973) study appeared to produce a meaningful result, the subjectivity of the reports may be an issue, and the requirement for participants to consciously report their state on demand may adversely affect their ability to achieve the required state. A number of researchers have used a more objective psychophysiological method of assessing participant state, namely the electroencephalogram (EEG). Electroencephalography involves the measurement, via electrodes attached to the scalp, of voltage fluctuations caused by electrical activity in the brain, that propagate outwards through conductive scalp tissues to the surface of the skin (Charman 2006: 2). The oscillatory nature of EEG traces has led to the activity being informally referred to as "brain waves" (Andreassi 1995: 21), with different frequency bands of these waves broadly corresponding to particular types of mental activity. Much research has focussed on the four most common bands; beta

frequencies, of 13-30 Hertz (cycles per second) are associated with everyday conscious mental activity; alpha frequencies (8-13 Hz) occur in a relaxed, waking state, particularly with the eyes closed; theta frequencies (4-7 Hz) appear in the drowsy state prior to sleep; and delta frequencies (1-4 Hz) occur in deep sleep (Charman 2006: 2).

It has therefore been possible to examine whether success in ESP tasks is associated with a particular band of EEG activity. In an early review, Beloff (1974: 418) noted that there was a "strong suggestion" of an association between a high proportion of alpha activity and ESP scoring, but the evidence was not conclusive. Palmer (1978: 123-124) subsequently noted that research of this kind had focussed almost exclusively on the alpha band, due to its association with a relaxed state of mind that appeared to be psi-conducive. For example, in a study of 10 participants, Honorton (1969) found forced-choice Zener card clairvoyance scoring to be significantly positively related to participants' alpha levels as recorded from the posterior occipital region; however, a follow-up study by Honorton and Carbone (1971), also with 10 participants, found the relationship to be significant and negative. The research base as a whole tended to follow this pattern of inconsistency, with Palmer (1978: 127) concluding that there was no simple relationship between ESP scoring and alpha. However, Palmer (1978: 128) also noted that the success of the ganzfeld method would suggest that hypnagogic-like states may be psi-conducive, and therefore that theta activity may be more closely related to ESP scoring, compared to alpha. However, a later review by the same author (Palmer 1982: 56-57) identified a similar focus on alpha, and similarly inconsistent findings.

Around this time, other researchers did begin to appreciate that frequency bands other than alpha could be important. Similarly to Palmer (1978: 128), Healy (1986: 353-355) emphasised the potential importance of theta, referring to its ostensible prevalence in the psychic phenomena of well-known mediums Eileen Garrett and Leonora Piper. Healy (1986: 356) also referred to the findings of Stanford and Stevenson (1972); these researchers, using Stanford as the single participant in a free-response study, found a significant tendency for lowered alpha frequencies in the O2 (right occipital) area during a "mind clearing" phase to be related to higher ESP scoring. They also noted that Stanford would sometimes hyperventilate spontaneously in order to clear his mind, which was known to cause a decrease in EEG frequency, and which may therefore have led to activity in the theta range (Stanford & Stevenson 1972: 365); however, theta activity was not measured in this study. In a later study that did examine theta, Heseltine and Kirk (1981) measured EEG from the frontal, central and parietal areas of the right hemisphere of a single participant, using 500 binary digits as targets; ESP scoring was significantly above MCE when the participant's EEG was in the low alpha range (8-9 Hz), but non-significant in the theta range.

Given that Stanford and Stevenson's (1972) relatively early study suggested the importance of theta, it is perhaps surprising that so many subsequent studies focussed exclusively on alpha. However, in the 1980s and 1990s one particular research team conducted a series of studies examining all of the major frequency bands. Using a single male participant, Warren and Don (1987) measured EEG from the Fz (midline frontal), Pz (midline parietal), C3 (left central), C4 (right central) and O1 (left occipital) areas in a clairvoyance task using Zener cards. The researchers reported that

the alpha band "only slightly related" to hitting, and suggested that this non-significant result may have been due to individual characteristics of the participant, who tended to show much greater power in the high frequency region (Warren & Don 1987: 60). A second very similar study with the same participant, only with the Oz site (midline occipital) measured instead of O1, found that hitting was significantly associated with increased beta power (13Hz and above) in C4 and Oz; for the latter, hitting was particularly related to a higher beta band of 35-45 Hz (Don *et al*. 1989). A third study (Don, McDonough & Warren 1996), also with the same participant, used a clairvoyance task with four of the five Zener card symbols (star, wave, cross and circle); twelve runs of 24 guesses were performed, with scoring significantly above MCE on run 1 (termed the "psi-hitting run"), significantly below MCE on run 5 ("psi-missing run"), and exactly at MCE on runs 4, 7 and 10 ("chance runs"). The use of an EEG cap allowed measurements to be taken from 19 sites, covering the whole scalp. The psi-hitting run showed significantly greater T4 (right temporal) power and significantly lower T3 (left temporal) power for theta, alpha and beta, compared to the chance runs. The psi-missing run showed non-significantly lower T4 power for theta, significantly lower T4 power for alpha, and significantly greater T4 power for beta, compared to the chance runs. There were no significant differences at T3 in theta, alpha or beta when comparing the psi-missing run with the chance runs. It is unclear why the psi-hitting and psi-missing runs were not directly compared; the researchers also acknowledge that comparing runs, rather than individual hitting and missing trials, means that observed differences in EEG may be due to spurious differences in psychological state, such as fatigue, alertness and mood (Don *et al*. 1996: 11).

McDonough, Don and Warren (1989) also assessed a single female participant using a clairvoyance task with Zener cards, measuring EEG from the Fz, Pz, Oz, C3 and C4 areas. Compared to missing trials, hitting trials demonstrated significantly higher power in the theta and 35-45Hz bands at C4. A second study with the same participant (McDonough, Warren & Don 1989) used playing cards as targets, with the experimenter cycling through the cards until the participant pressed a button when she believed that a pre-specified randomly selected target card had been reached. Telepathy and clairvoyance trials were performed; on telepathy trials the experimenter viewed the card faces, while on clairvoyance trials he viewed their backs. EEG was recorded from the C3, C4, T3, T4, O3 and O4 sites (left and right central, temporal and occipital regions respectively). ESP scoring was not significant overall, so EEG data were not analysed for the whole data set, with the researchers justifiably arguing that it is not worthwhile examining correlates of ESP when there is no evidence for ESP in the data (McDonough, Warren & Don 1989: 189); however, one block of trials with significant hitting was examined post hoc. In this block, pooling telepathy and clairvoyance trials, hitting trials showed significant increases in theta and delta power at all sites, and a marginally non-significant reduction in alpha power at occipital sites, compared to misses.

Don, McDonough and Warren (1990) tested a single male participant using a token object task, involving examining a set of pens and, for each pen, guessing the gender of the person who had signed their name once a day for a week with that pen. EEG was measured from the C3, C4, T3 and T4 sites. Two experiments were conducted; experiment 1 showed no evidence of ESP, while experiment 2 showed significant psi-missing, with misses associated with significantly greater power in high beta

frequencies (46-62Hz) at T4, compared to hits. Later, McDonough, Don and Warren (1996) used McDonough as the participant in a forced-choice clairvoyance task with a choice of four cartoon-like figures as targets. Seven experiments were conducted, each of 100 trials, with EEG recorded in studies 2 and 7, from left and right anterior temporal and posterior temporal sites. These studies were individually non-significant for hitting, but hitting was significant across all 7 studies combined; based on this result, the researchers reasoned that psi may have been operating throughout the entire series of studies and therefore that analysis of the EEG data was worthwhile (McDonough *et al*. 1996: 13). Compared to misses, hits were associated with significantly greater alpha power at posterior sites and significantly reduced alpha power at anterior sites.

All of the research by this team discussed so far has focussed on single participants. However, McDonough, Don and Warren (1994) also conducted one study involving 20 professional artists, consisting of a mixture of male and female actors, writers, dancers, musicians and visual artists. Each participant took part in a single trial as receiver in a ganzfeld GESP study, with EEG measured from 19 sites covering the whole scalp. Receiver judging achieved 6 hits, while experimenter judging achieved 9 hits, which was significant by a one-tailed test. Based on the experimenter judging, delta and theta power were significantly higher for misses than hits, and alpha power was non-significantly higher for hits than misses (all averaged across the scalp).

Overall, these findings are marked by their inconsistency. The work of McDonough, Warren and Don has improved greatly on previous research by examining the full range of EEG frequencies, but most of their studies have used only a single

participant, which clearly creates issues regarding reliability, validity and generalisation of results; in addition, several of their findings are based on post hoc analyses or, in the case of their twenty-participant study, analyses based on only one of multiple indices of success. McDonough *et al*. (1996: 15) concede that their inconsistent findings raise questions about the reliability of EEG effects, and are aware that "[a] skeptic might argue that non-significant or haphazard EEG effects are just the sort of thing one would expect by chance if psi were not operating in any of the experiments". However, it is entirely possible that the weaknesses of their research, and the research of others, have led to this inconsistency. Research that has examined only one frequency band may have missed any effects relating to the other bands, while research that has examined multiple frequency bands of only a single participant may have been adversely affected by any idiosyncrasies of that individual. Furthermore, even McDonough *et al*.'s (1994) largest study, with 20 participants, obtained only 9 experimenter-judged hits, meaning that this subset of trials was also rather small. However, the key advantage of McDonough *et al*.'s (1994) study was its use of the ganzfeld as an ostensibly psi-conducive experimental paradigm, in preference to the forced-choice methodology that had been employed in many previous studies. Therefore, although the observed results are indeed inconsistent, there has not yet been a study that has combined a sufficiently large sample size with a psi-conducive procedure and assessment of all of the main EEG frequency bands. The conducting of such a study, or series of studies, would clearly be highly desirable to clarify whether there are any consistent associations between EEG activity and ESP.

6.3. Conscious and Unconscious Psi

Although the previously-discussed studies have all measured EEG activity during ESP trials, they all attempted to detect what Radin (2006: 98) refers to as "conscious psi". This is the case with most parapsychological studies; the participant must make a conscious choice or, in the case of independent judging, the judges must make their decisions using the participant's report of their conscious impressions. As discussed in Chapter 2, a number of suggestions have been made regarding how psi information becomes accessible to consciousness. Early ideas by Tyrrell (1946) appear to have been key in influencing theorisation on this matter, proposing that information first becomes accessible to an individual via a parapsychological process, before being transferred into consciousness via psychological processes termed "mediating vehicles" (Tyrrell 1946: 72). Rhine (1953a: 113) suggested that, after the ESP information arrives unconsciously, it undergoes some form of unconscious judgement process; if this process deems it to be of relevance then it is transferred into consciousness in one of the forms of experience (intuitions, hallucinations or dreams), which are also the end result of different unconscious mental processes (Rhine 1978: 23). Rhine (1978: 25) proposed that the ESP information accessible to the percipient is essentially complete and correct, but that errors arise during its transfer into consciousness. In contrast, Schouten (1983: 337) proposed that only the most essential information is available to the percipient at an unconscious level; the form of experience depends on the level of "creative activity" that occurs, which adds non-ESP elements to the experience from fantasy and memory. Similarly, Roll (1966, 1987) and Irwin (1979 cited in Edge *et al*. 1986: 192) suggested that the experience is

created from activated memory traces, and Stevens (2002) refers to the experience being created by imagination relating to the target.

These various theories suggest that the conscious experience based on psi information may be very different to the actual information received. In addition, the experimental paradigm may restrict the form of conscious experience that is most useful to succeed in the task; forced-choice testing with Zener cards would appear to rely on intuition, while free-response ganzfeld testing would seem to rely on hallucinations or waking dreams. However, it is also possible that ESP information becomes accessible to an individual, but is not transferred into consciousness, or is transferred in a manner whereby the individual is unaware of it. Rhine (1978: 31) proposed that psi information was selected from a background of items, but considered that, given the apparent lack of spatial or temporal limits to psi, this background of items involves "the entire panorama of events", which would suggest omniscience; while Rhine (1978: 31) acknowledged that this concept is difficult to accept, it does suggest that percipients may have access to considerably more information than becomes apparent in consciousness. As discussed in Chapter 2, Stanford's (1974, 1990) psi-mediated instrumental response (PMIR) model proposes that individuals can alter their behaviour based on psi information without being aware that they are doing so, with Stanford (2006: 122) suggesting that, "contrary to popular assumption, conscious awareness of the [psi] information may be the exceptional case". Therefore, rather than relying on participants' conscious impressions, the search for "unconscious psi" (Radin 2006: 131) may be more rewarding.

A number of studies have been conducted to examine unconscious psi responses, using a variety of physiological measures such as skin conductance, heart rate and blood flow. Past research, and the study reported in Chapter 3, have identified spontaneous cases of ESP that have a purely emotional component (e.g. Rhine 1953a: 88) or involve bodily sensations (e.g. Rhine 1953a: 93-95), so assessing physiological measures of this kind would appear to be a plausible manner of testing for ESP; similarly to the ideas of Stanford (1974, 1990, 2006), Beloff (1974: 404) proposes an analogy with subliminal perception, in that individuals may display physiological responses to a stimulus even without any conscious awareness of that stimulus.

Several studies that used physiological measures to detect ESP were discussed in Chapter 4. For example, Rice *et al*. (1966) examined galvanic skin response (GSR) deviations in receivers while senders experienced a blank cartridge being fired in their presence, or had their feet immersed in ice water; for both of these occurrences significantly higher GSR readings were found in experimental pairings compared to control pairings. Esser *et al*. (1967) used a plethysmograph to detect changes in blood volume in a receiver while their twin was viewing words with specific personal meaning to the receiver, and Barron and Mordkoff (1968) assessed skin resistance, heart rate and respiration in a receiver while their twin was watching an emotionally arousing film; some suggestive results were found in both of these studies, although no significant findings were obtained. Hearne and Worsley (1977) conducted a dream ESP study in which senders were presented with animals of which they and the receiver were phobic, but there was no evidence of any physiological reaction in the receivers in terms of heart rate or eye movements. More recently, PK studies of Direct Mental Interaction with Living Systems (DMILS), where a participant aims to

influence the behaviour or physiology of another organism, have commonly measured the electrodermal activity (EDA) of 'receiving' participants, with some success (Delanoy 2001). Again, overall findings are marked by inconsistency, but the examination of physiological responses in receivers would at least seem to be a promising area for continued study, if only due to their increased objectivity and the difficulty in producing fraudulent results. These aspects, together with the potential to view specific responses as indicative of ESP 'in action', render any significant findings from these studies as perhaps more compelling than those based entirely on the apparent 'guesswork' required in studies necessitating conscious responses.

6.4. EEG Research: Event-Related Potentials

6.4.1. Event-Related Potentials

In addition to the EEG studies discussed earlier, that examined EEG frequencies associated with success in ESP tasks, a number have attempted to detect unconscious psi responses in a similar manner to studies using other forms of physiological measurement. Studies of this kind have focussed on 'event-related potentials' (ERPs), a term created by Vaughan (1969 cited in Andreassi 1995: 72) to refer to "a variety of brain responses that show stable time relationships to actual or anticipated stimuli". For example, on the application of a sudden sensory stimulus, or series of stimuli, the EEG trace will demonstrate voltage fluctuations in the relevant cortical areas (Charman 2006: 3). 'Spontaneous' EEG activity will often obscure the ERP, so a response is not necessarily evident in a single instance; ERPs are therefore usually observed following averaging of the brain's response to repeated stimuli (Warren,

McDonough & Don 1992: 2). The ERP is time-locked to the onset of the stimulus, and averaging has the effect of cancelling out the background EEG while maintaining the amplitude of the ERP (Warren *et al*. 1992: 2).

6.4.2. ERP Research Examining Clairvoyance and Precognition

Warren *et al*. (1992) examined ERPs of a single male participant, using a computerised ESP task that sequentially presented four graphic stimuli, one of which was randomly selected as the target. Following sequential presentation, all four stimuli were displayed simultaneously, with the participant required to select which he believed was the target. Twenty runs of 10 trials were performed; half of the runs tested clairvoyance, where the target was selected at the beginning of the trial, while the other half tested precognition, where the target was selected after the participant had made his choice. The participant was unaware of whether clairvoyance or precognition was being tested in any individual run. EEG was recorded from 10 sites, namely the left and right frontal (F3 and F4), central (C3 and C4), anterior-temporal (T3 and T4), posterior-temporal (T5 and T6) and occipital (O1 and O2) areas. For ERP analysis, trials from precognition and clairvoyance conditions were pooled. The participant scored non-significantly below MCE based on his target guesses, but ERP analysis demonstrated significant differences between the responses to targets and non-targets. The amplitude of a positive peak occurring approximately 100ms following stimulus presentation (P100) was significantly larger for targets than non-targets at F4, C4 and T4. The amplitude of a negative peak occurring at 400-500ms following stimulus presentation (negative slow wave, NSW) was also significantly larger for targets than non-targets, across all sites. The researchers noted that there

were no obvious novel components of the ERP that might directly indicate psi (Warren *et al*. 1992: 18); they also observed that psychological research had demonstrated similar amplitude differences between various categorically different sets of stimuli (Warren *et al*. 1992: 23). Therefore, they proposed that what had been detected was not the psi process itself, but the preconscious transformation of the already-received psi information through conventional information-processing mechanisms (Warren *et al*. 1992: 24). However, despite the significant findings, the researchers conceded that the exploratory nature of the study increased the likelihood of finding the effects by chance (Warren *et al*. 1992: 18).

Warren, McDonough and Don (1996) subsequently reported a replication attempt of their previous study, with the same participant. The participant again scored non-significantly below MCE for his target guesses. For the NSW there was a marginally significant interaction between hemisphere and stimulus type, such that the amplitude of the NSW in the left hemisphere was slightly greater for targets compared to non-targets, but there were no significant findings for the P100. The findings of the previous study were thus only partly replicated, and only to a weak degree. Nevertheless, the researchers considered the NSW finding as supporting their suggestion of preconscious transformation of the already-received psi information, and proposed that the differences between the results of the studies may have been due to a change in the strategy adopted by the participant (Warren *et al*. 1996: 20); however, no specific strategy changes were identified as having been responsible for these differences.

Following their studies with a single participant, Don, McDonough and Warren (1998) attempted a replication with 22 participants. The task was framed as a gambling task, with the four playing card suit symbols as stimuli; each participant completed 80 trials, with 40 trials played with a bet placed and 40 without. All trials were presented in the precognition mode, with participants not informed of the psi component of the study. EEG was recorded from 19 sites covering the full scalp. Based on further examination of their previous findings, prior to the study the researchers distinguished between their original NSW, which they re-termed the Late Negative Slow Wave (L-NSW), and an Early Negative Slow Wave (E-NSW), in the 150ms to 400ms latency range. In addition, based on the replicated findings from the previous studies, main analyses were conducted only on non-betting trials and restricted to the five left hemisphere recording sites (F3, T3, C3, T5 and O1) that had shown differences between targets and non-targets. In terms of guessing accuracy, participants tended towards hitting on betting trials and missing on non-betting trials, but non-significantly so. For L-NSW, results were in the hypothesised direction but non-significant; the L-NSW was less positive following targets than following non-targets. However, for E-NSW the results were as hypothesised and significant; the E-NSW was significantly less positive following targets than following non-targets. Post hoc analyses demonstrated non-significant results for betting trials and for the five analogous right hemisphere recording sites on non-betting trials, although the results for the latter were in the same directions as those for the left hemisphere. Despite the non-significant results for the L-NSW, the researchers considered this overall to be a successful replication that demonstrated generalisability of the findings and provided further evidence of unconscious or preconscious psi (Don *et al*. 1998: 137).

McDonough, Don and Warren (2002) subsequently replicated the gambling task study with 20 more participants. Prior to the guessing task, the participants performed an arithmetic problem-solving task; half of the participants performed a simple, "low stress" version, while the other half performed a complex, "high stress" version. However, for the ERP analyses all participants were pooled. Stimuli for each trial were playing cards of the same rank but of the four different suits. Based on their earlier findings, the researchers defined a single Slow Wave (SW), in the 150ms to 500ms latency range, combining the E-NSW and L-NSW ranges. Guessing accuracy was non-significantly above MCE. As in the previous study, main ERP analyses were only performed on non-betting trials. Data from a subset of 12 recording sites were analysed (F3, F4, C3, C4, P3, P4, F7, F8, T3, T4, T5 and T6). The SW was significantly more negative for targets than for non-targets over the 6 right hemisphere sites, but there was little difference for the left hemisphere. Post hoc analyses on the E-NSW and L-NSW ranges demonstrated that this same result was obtained in both instances, to a significant degree for the latter but not the former. The researchers noted the hemispheric differences in the effects obtained in their studies, proposing that these may have been due to differences in the EEG reference or to the mechanism used for participants to make their conscious responses; they therefore argued that the similarities in the ERP effect suggested that the result had been replicated across all four studies (McDonough *et al*. 2002: 201-202).

Overall, based on their consistent attainment of significant results, the findings of this research team initially appear somewhat promising. The implication of these findings is that, although none of the studies demonstrated significantly above-MCE hitting based on participants' conscious guesses, participants' ERPs demonstrated evidence

of unconscious or preconscious responses to targets. This also illustrates an important advantage of the researchers' chosen method of sequential stimulus presentation, as this allows comparison of responses to targets and non-targets rather than comparison of hits and misses, where the hits may be largely or entirely due to chance rather than ESP. The quality of these researchers' work is further demonstrated by the fact that, in a largely sceptical text, Smith (2010: 256) notes that the study reported by Don *et al*. (1998) is "the only such study cited without criticism by at least one highly respected researcher in a top professional journal".

Despite the methodological advantages of this series of studies, and the researchers' claims of replication, there are some important discrepancies in the results. The initial study with a single participant (Warren *et al*. 1992) identified a significantly larger P100 amplitude for targets than non-targets at F4, C4 and T4, but this was not found in the follow-up study with the same participant (Warren *et al*. 1996). Similarly, whereas the NSW amplitude was significantly larger for targets than non-targets across all sites in the initial study, this was only true for sites in the left hemisphere in the follow-up. In the third study, although the apparent importance of the left hemisphere remained, the results for the NSW (re-termed L-NSW) were not significant, while the results for the newly identified E-NSW demonstrated a significant difference between targets and non-targets (Don *et al*. 1998). In the fourth study, significant differences between targets and non-targets were now observed in the right hemisphere for a combined SW, and post hoc tests suggested this was significant for L-NSW but not E-NSW (McDonough *et al*. 2002). It is therefore clear that, although these studies remain of interest due to the attainment of significant results in each, the researchers' claim of replication is not well-founded, particularly

since no other research teams have attempted independent replications of these studies.

A more recent example of apparent precognition was obtained by Kittenis (2011), in a study not intended to investigate psi. The study was examining mood and face recognition, involving 10 participants with bipolar disorder and 10 healthy controls. Sad or neutral mood was induced by asking participants to recollect autobiographical memories, and participants were then required to discriminate between familiar and unfamiliar faces presented on a screen. EEG was recorded from 28 sites across the scalp. Unexpectedly, there was a significant difference in measures of phase synchronisation (phase relation of EEG oscillations between two regions) between the two types of faces. This effect was found in frequency bands of 3-6Hz, 6-12Hz and 12-22Hz, broadly corresponding to the theta, alpha and beta bands respectively. The effect occurred within the one-second period prior to stimulus onset, and was "fairly widely distributed" (Kittenis 2011: 205) across electrode sites. Several possibilities were identified in terms of the effect being an artefact, and correcting for one of these removed the apparent effect; however, this reduced the sensitivity of the analyses such that the non-parapsychological main effects were also rendered non-significant. It was also considered as a possibility, although unlikely, that poor randomisation of stimuli may have caused the effect (Kittenis 2011: 205-206). This finding is therefore intriguing, but requires replication.

6.4.3. ERP Research Examining Telepathy

The ERP research discussed so far has examined either clairvoyance or precognition. Much other research has examined whether brain activity can be 'transferred' telepathically between two individuals. One point worthy of note here is the difference between the concept of telepathy as communication between two minds (Charman 2008: 5) and communication between two brains; the use of ERPs to examine ostensible telepathy implies that an occurrence in one brain may lead to, or correlate with, a corresponding occurrence in another brain, which may provide evidence against a dualistic interpretation of mind. Charman (2006) provides a detailed review of this research, of which a selection of key studies will be covered here.

Charman (2006: 3) notes that the most frequently used stimulus for the sender is a series of flashes of light, which lead to 'visual evoked potentials' (VEPs). However, what appears to have been the first study of this kind, by Duane and Behrendt (1965), used eye closure of one participant to examine whether concomitant alpha rhythms would be elicited in the EEG of the other participant. Due to its use of twin pairings, this study was described in Chapter 4; in summary, 2 of the 15 MZ twin pairs did show apparent extrasensory induction of alpha rhythms in the occipital region, while none of the unrelated pairs did so. However, analysis of the EEG traces was by inspection only, and the single-page report has been criticised for lacking in detail, rigour and adequate controls (Charman 2006: 5). Charman does not appear aware of the attempted replication by Dean (1966), also discussed in Chapter 4, that was performed with 24 pairs of twins, 10 of whom were MZ; however, EEG was only

recorded from the receiver in this study, and no differences in alpha activity were found between the sender's eyes-open and eyes-closed periods.

The first study to utilise flashes of light to induce VEPs appears to have been conducted by Targ and Puthoff (1974). EEG was recorded from the Oz site of receivers only. Senders viewed 10-second trains of flashes, either at 6Hz or 16Hz, or viewed no flashes in control trials. Given the length of the trains, the researchers expected to view a phenomenon termed 'photic driving' (Charman 2006: 6), which occurs when an individual is stimulated with a flashing light; this leads to a decrease in the amplitude of the resting rhythm and an increase in the amplitude of rhythms at the frequency of the flashes (Hill & Parr 1963 cited in Targ & Puthoff 1974: 606). Of the six participants tested as receivers, none showed evidence of driving in response to flash stimulation of senders, but one female participant did show consistent reductions in alpha, termed 'alpha blocking'. This participant was subsequently tested further, and showed significant alpha blocking on the 16Hz trials, with non-significant blocking on the 6Hz trials. Charman (2006: 6) notes that, in addition to the trials with senders, alpha blocking occurred on a set of trials in which there was no sender, a fact of which the participant was unaware. This would suggest the operation of clairvoyance rather than telepathy, but conclusions cannot be drawn from this single instance.

One study not included in Charman's review was that of Hearne (1977), whose research was discussed in Chapter 4. This study used 8 pairs of participants and is noteworthy since it was the *receiver* who was stimulated with a single light flash approximately every two seconds, for 8 trials of 100 flashes. The stimulation for the

sender consisted of viewing a tachistoscope that briefly displayed a photograph of the receiver at the same time that the receiver saw each light flash; this was used in half of the trials. EEG was recorded from the occipital area of receivers, with their VEPs compared between trials with and without the use of the tachistoscope. Results demonstrated a significantly lower amplitude of a negative peak, occurring approximately 65ms after stimulation (N65), for with-tachistoscope trials compared to without-tachistoscope trials. Hearne (1977: 656) proposed that, if the sender does produce an ESP 'signal', then the early response evident in the VEP suggested the occurrence of virtually instantaneous transmission and very limited processing; the signal would be received by the receiver before either participant consciously perceived their stimuli.

Grinberg-Zylberbaum *et al*. (1992) conducted a series of three studies with pairs of participants in separate sound-proof, electromagnetically shielded chambers. Prior to the trial, the pairs sat together in one of the chambers for twenty minutes while they attempted to develop "nonverbal, empathic communication in which they could feel each other's presence directly, without the need of any vocalization or physical contact" (Grinberg-Zylberbaum *et al*. 1992: 29). Once this state of communication was achieved, one participant was taken to the other chamber. Both participants had their EEG measured from the vertex (Cz). The participant remaining in the original chamber was stimulated with a series of simultaneous visual (light flashes) and auditory (1,000Hz tone) stimuli at random intervals. This procedure was performed by five pairs of participants, with an additional pair used as a control; these control participants did not interact and were unaware of the other's presence in the other chamber. For the empathic pairs, similar waveform morphology was identified for the

evoked potential and the 'transferred' potential, with high Pearson correlations ($r > .6$) reported over specific portions of the latency range, although these portions appeared to differ depending on the pairing. The control pair of participants did not show 'transferred' potentials, but a clear comparison is not possible with only one such pairing.

The second study was conducted in a similar manner, but with some changes, a number of which were introduced to counteract the possibility of equipment artefacts causing the findings. Seven pairs were used, with some pairs swapping roles following the first set of trials. Only the light flash stimuli were used, but in some cases the sender kept their eyes closed, in others they lay down and observed the flashes with their eyes half-open, and in others the lamp was located outside the chamber, with the light entering the chamber through a one-way glass pane. EEG was measured from Cz in some cases, and using a bipolar measurement of Cz and Fz (measuring the difference between these two sites) in others. In some cases, only the EEG of the receiver was recorded. 'Transferred' potentials were identified for 8 (57%) of the participants. No differences were obtained between the monopolar and bipolar EEG traces, other than a clearer recording in the latter.

The third study used four participants, who all sat together in one of the chambers to develop empathic communication. Following this, three participants moved to the second chamber to act jointly as senders, and were stimulated with light flashes. EEG was recorded from Cz; it is not clear whether the EEG of a single sender or all three senders was recorded, but a strong 'transferred' potential was apparently identified. Overall, Grinberg-Zylberbaum *et al*. (1992: 41) considered the results to demonstrate

that evoked potentials in one participant can be 'transferred' to another, and that empathic communication is necessary in order for such transfers to occur; however, this latter point is contentious given the assessment of only one non-empathic pairing. The results were also held to support the first author's Syntergic Theory, which postulates that neuronal changes produce a distortion in the lattice of the space-time continuum, with the interaction of each of these small distortions creating a much larger distortion termed the Neuronal Field. Perceptual experience is then the result of the interaction of this Field with the space-time continuum, so the activity of other brains can be detected through this same interaction between one Neuronal Field and the lattice, or with other Neuronal Fields (Grinberg-Zylberbaum *et al*. 1992: 26-27). However, it does not seem that other researchers have adopted this theory, and the results can be criticised since it is possible for the correlation analyses to have identified chance correspondences between EEG traces, hence the differing latency ranges in which correspondences were identified for each pairing. Similarly, McDonough *et al*. (2002: 189) criticise the researchers for not presenting any inferential statistics, in addition to using "unusually severe" high-pass filtering of their ERP data, and using inadequate controls against sensory leakage; however, they do not give any further details on these latter two points.

Similarly to the previous series of studies, Wackermann *et al*. (2003) placed their participants in separate acoustically and electromagnetically shielded rooms. Two experimental groups, each of seven pairs, were used; one (E_1) consisted of related emotionally connected pairs (spouses, relatives and friends) and the other (E_2) consisted of unrelated pairs. A control group was also created, consisting of three related pairs (K_1) and four single participants (K_2). The E_1 group were able to spend

approximately twenty minutes together before the sessions, developing an empathic bond through a method of their choice; the E_2 group were given the same amount of time to relax but were not aware of the presence of their experimental partner. In these two groups the receiver relaxed while the sender viewed a computer screen. The stimulus consisted of a black-and-white checkerboard, displayed on the screen, that was presented and then colour-reversed three times in a duration of 1 second; this was shown 72 times per session, at intervals varying randomly between 3.5 and 4.5 seconds. Group K_1 underwent the same procedure as group E_1, but the screen was concealed with an opaque cover so that the checkerboard pattern could not be seen. Group K_2 consisted of single participants who acted as receivers while the checkerboard stimulus was displayed in the empty room. EEG was recorded from senders and receivers, at the C3, C4, P3, P4, O1 and O2 sites, referenced against the Cz site. As expected, K_1 and K_2 receivers did not show any apparent EEG responses. However, for the E_1 and E_2 groups, results demonstrated a high coincidence of variations in the EEG of receivers with variations in the EEG of senders. The researchers noted that these variations were inconsistent and did not show the similarity in waveform morphology identified by Grinberg-Zylberbaum *et al*. (1992); nor did the positive results for the unrelated E_2 participants suggest the requirement for an empathic bond (Wackermann *et al*. 2003: 63). Wackermann *et al*. (2003: 63-64) concluded that methodological failure and technological artefact could be ruled out, but that "no biophysical mechanism is presently known" that could explain the findings.

More recently, Ambach (2008) attempted a replication of the study by Wackermann *et al*. (2003) with 17 pairs of related participants (friends, relatives and partners), using a

checkerboard stimulus and recording EEG from 19 sites across the full scalp. Experimental runs were compared with control runs in which the monitor screen was covered. Modifications were made to the statistical methods of Wackermann *et al*. (2003), due to the possibility of overestimation of effects. EEG of receivers did not differ significantly between no-stimulation and with-stimulation periods of the sender. The difference between the experimental and control runs was close to significance, but Ambach (2008: 144) argued that this was a likely consequence of multiple analyses, and considered the overall findings as a failure to replicate those of Wackermann *et al*. (2003).

Kittenis, Caryl and Stevens (2004) conducted a study using 41 participants in total, consisting of 13 'related' pairs (close friends, relatives or lovers), 5 'unrelated' pairs (who did not know each other and did not meet before the session) and 5 individual participants who were falsely told that they were part of a pair. Prior to the trial, members of the pair listened to a progressive relaxation procedure with suggestions for entering a hypnagogic-like state, followed by 15 minutes of 4-5Hz drumming, to induce an altered state of consciousness. EEG was measured from the receiver only, from 32 sites covering the whole scalp, throughout the drumming period. During this time the sender wore dark glasses with LEDs attached, which produced flashes of light at random intervals; for the 5 unpaired participants the flashes occurred with no sender to observe them. Unpaired participants showed no clear EEG response to the flashes. In related and unrelated pairs receivers demonstrated higher alpha power post-stimulus than in the pre-stimulus baseline, whereas control periods showed a slight decrease; this difference was significant for related pairs and for related and unrelated pairs combined. These results were combined due to the small number of

unrelated pairs, which also precluded any direct comparison between related and unrelated pairs, but it would appear that there was no advantage for the related pairs. The response was localised to the posterior parietal and occipital regions, as would be expected for a response to a visual stimulus. However, the most intriguing finding was that the receiver's response appeared to begin 150ms before presentation of the stimulus to the sender, and peaked 50ms before the peak of the sender's response. The researchers therefore suggested that these cannot be considered as responses per se; they may be due to fluctuations in alpha power caused by unknown factors, or may be better considered as "non-local biological interactions" or "remote psychophysiological correlations" (Kittenis *et al*. 2004: 14).

Persinger *et al*. (2010) conducted three studies based on Sheldrake's (1981 cited in Persinger *et al*. 2010: 231) hypothesis of morphic resonance, that suggests an occurrence at one location can lead to an occurrence at another location due to "the existence of a resonance independent of distance and attenuation of power that occurs between two very similar or identically complex structures by virtue of this similarity". Persinger *et al*. aimed to induce similarity of complexity in the brains of separated participants, by placing a circumcerebral array of eight solenoids around the heads of each participant and activating the solenoids in a specific pattern to create complex magnetic fields. In the first study, six pairs of strangers were used as participants, with the sender randomly assigned and placed in an electrically and acoustically shielded chamber. Following an activation pattern of the solenoids, baseline EEG was recorded from the receiver at F7, F8, T3, T4, P3, P4, O1 and O2; a green light flashing at 8.3Hz was then presented to the left peripheral visual field of the sender, during which time EEG continued to be recorded from the receiver. For

one of the six solenoid activation patterns, significantly increased power for 8-9Hz EEG activity was apparent in the right hemisphere, particularly the parietal lobe, when the light flashes were presented to the sender. This was apparent for all six receivers.

In the second study, a single pair of participants was tested, with light flashes of 5Hz, 10Hz and 15Hz, using a white light that illuminated the entire chamber. A significant result was obtained for one of the six solenoid activation patterns, although this was a different one to that from the previous study. Increased power in the 10-13Hz EEG activity range was observed over the right parietal lobe, particularly when the sender was viewing the 10Hz flashes.

For the third study, three pairs of participants took part, EEG was recorded from 19 sites over the full scalp, and light flashes of 5Hz, 8Hz, 10Hz and 15Hz were used. Of the six original solenoid activation patterns, only the two that had been associated with success in the first two studies were used. Another significant result was obtained; increased power in the 8-8.9Hz activity range was observed, primarily over the P4 and T4 sites, when the sender was viewing the 8Hz flashes, with this effect most pronounced for the successful solenoid activation pattern from the second study. Persinger *et al*. (2010: 234) noted that, overall, the results suggested the right parietal area was the most responsive, and the increased EEG activity range in each case appeared to be of similar frequency to that of the light flashes. The researchers further suggested that the simultaneous creation of complex magnetic fields had synchronised EEG microstates for the pairs of participants, producing a degree of similarity sufficient to simulate Sheldrake's 'morphogenic fields' (Persinger *et al*. 2010: 234).

The replication of the key results across these three studies does appear impressive, but the hypothesis of morphic resonance has been heavily criticised as being pseudoscientific (e.g. Rose 1992).

In summary, ERP research examining telepathy has been conducted by a wider range of research teams than ESP research examining clairvoyance and precognition. Again, there is some inconsistency in the results; some findings appear suggestive of an anomalous process, while others do not. Furthermore, some of the apparently positive findings have been obtained from studies with small sample sizes, or have been based on inspection of ERP waveforms without any inferential analyses. However, there remain some intriguing results, such as the replication evident in the series of studies by Persinger *et al*. (2010). As with much of the research discussed in this chapter, it is also apparent that few of the studies have attempted to use an ostensibly psi-conducive experimental paradigm such as the ganzfeld; it is notable that the study by Kittenis *et al.* (2004), that included an attempt to induce a hypnagogic-like altered state of consciousness in receivers, was one of those that produced significant results. It is therefore possible that some of the inconsistency in the findings may be due to the different methodologies employed.

6.5. fMRI Research

EEG has been the primary measure of brain activity in psi studies, but more recently the technique of fMRI (functional magnetic resonance imaging), which measures blood flow in the brain, has begun to be used. Blood-oxygen-level-dependent (BOLD) imaging assesses changes in magnetic susceptibility due to the paramagnetic effects of

deoxyhaemoglobin during activity in the brain (Standish *et al*. 2003: 123); this has the advantage of providing more detailed information about the location of activation than low-density ERPs (Moulton & Kosslyn 2008: 184). For example, Standish *et al*. (2003) conducted a study using two participants, who were visually, acoustically, electrically and magnetically shielded from one another. The receiver, in an MRI scanner, viewed a static checkerboard pattern through goggles, while the sender viewed a similar pattern on a video monitor. At randomly selected intervals the sender's checkerboard would colour-reverse at a rate of 6Hz, for a randomly determined length of time between 18 and 33 seconds. Two 300-second sessions were run, with the participants swapping roles after the first session. In the first session, a significant increase in blood oxygenation was observed in two areas of the visual cortex in the receiver while the sender was viewing the flickering checkerboard stimulus, but no significant results were obtained in the second session.

The same research team (Richards *et al*. 2005) conducted a second study with a different pair of participants. The same experimental setup was used, with the addition of a replication trial (each participant therefore taking part in two trials as receiver) and a physical barrier to ensure complete visual shielding of the participants from one another. For the first sender-receiver combination, in both trials the receiver showed significant activation in the left occipital regions when the sender was viewing the flickering stimulus. For the reversed sender-receiver combination, the receiver showed significant activation in the right occipital regions when the sender was viewing the flickering stimulus, but this occurred only in the second trial. Both studies thus demonstrated activation in the occipital areas of the receiver, as would be

expected for visual stimulation; however, the researchers acknowledge that the sample size is too small to draw firm conclusions (Richards *et al*. 2005: 961).

Moulton and Kosslyn (2008) conducted a study with 19 pairs of close participants, including couples, friends, MZ twins, a mother-son pair and a pair of sisters. For each trial a pair of image stimuli were used that were maximally separated based on valence (positive, neutral or negative) and arousal (high or low). One of these was randomly selected as the target, and the sender viewed this throughout the trial. While fMRI was used to monitor their brain activity, the receiver was shown one of the images for one second, followed by a fixation cross for between 2 and 6 seconds, followed by the second image for one second. They were then shown a screen asking them to press a key to select which of the images they believed was the target; after making their choice they were shown the target for one second, followed by a screen informing them whether or not they were correct. Each pair completed 5 sets of 48 trials, and receivers were given a dollar for each correct response. The researchers argued that this procedure allowed simultaneous testing of telepathy from the sender, clairvoyance from the sender's computer monitor, and precognition of the second presentation of the target (Moulton & Kosslyn 2008: 184). Guesses by the receivers were almost exactly at MCE, and the fMRI data showed no evidence of psi across the whole group. The data for one participant, from a romantic couple, showed evidence of significantly greater activity for decoys than targets, an effect resembling prior exposure to the target; this activity was centred in the superior temporal gyrus, with the highest activity occurring in the left hemisphere. However, Moulton and Kosslyn (2008: 189) suggested that this may have been an artefact due to a confound between stimulus characteristics and condition (target vs. decoy). Despite the researchers' bold

conclusion that "these findings are the strongest evidence yet obtained against the existence of paranormal mental phenomena" (Moulton & Kosslyn 2008: 182), there is insufficient research using fMRI to determine whether this technique is capable of demonstrating replicable evidence of psi. In addition, there is a similar lack of use of ostensibly psi-conducive methodology evident in these studies, as in many of those discussed previously.

6.6. Theories of 'Stage 1' of Psi

In Chapter 2 the early theorisation of Tyrrell (1946) was introduced. Tyrrell (1946: 72) proposed that ESP experiences involve two key stages; firstly, the information becomes accessible to the individual, and secondly, the information is transferred into consciousness. A number of theories were discussed relating to the ostensible second stage; although the theories differ on their specifics, they all appear to agree with Tyrrell's (1946: 72) early suggestion that this stage does not involve paranormal mechanisms, and that the paranormally-acquired information is transferred into consciousness via psychological processes termed "mediating vehicles" (Tyrrell 1946: 72). Rhine (1953a: 109, 1978: 23) observed that the main forms of ESP experiences, namely intuitions, hallucinations and dreams, are familiar psychological phenomena, with Schouten (1983: 337) suggesting that the form of experience depends on the level of "creative activity" by the percipient. Roll (1966, 1987) and Irwin (1979 cited in Edge *et al*. 1986: 192) propose that activated memory traces form the basis of the content of the experience, and Stevens (2002: 239) argues that ESP is "imagination that relates to the target". However, researchers such as Stanford (1974, 1990, 2006)

also argue that psi can affect individuals' behaviour without any conscious awareness of the ostensible psi stimulus.

In contrast to the relative agreement on the processes involved in stage 2, theories regarding stage 1, i.e. how the percipient actually obtains the psi information, have been more varied. As discussed in Chapter 2, without knowledge of what happens in this stage, the theorised processes of the second stage are necessarily somewhat speculative. Proposed theories such as the Syntergic Theory (Grinberg-Zylberbaum *et al*. 1992) and the hypothesis of morphic resonance (Sheldrake 1981 cited in Persinger *et al.* 2010: 231) have been mentioned earlier; the former does not appear to have been widely adopted and the findings of the researchers have been criticised (e.g. McDonough *et al*. 2002: 189), while the latter has been deemed pseudoscientific (e.g. Rose 1992). Other theorists (e.g. Vasilescu & Vasilescu 1996) have proposed more conventional mechanisms of the operation of psi, involving electromagnetic waves. However, Charman (2006: 20-21) notes that, although the function of the brain depends on electrical activity, such explanations are relatively unconvincing, for a number of reasons; brain-generated electrical fields are very weak, psi phenomena do not appear to obey the inverse-square law, and significant results have been obtained with participants in Faraday cages, which absorb electromagnetic radiation.

There has been recent interest in the area of quantum theory. Radin (2006: 1) noted the apparent connections between particles, which have been referred to by Einstein as "spooky action at a distance" and Schrödinger as "entanglement". When particles interact they can become entangled, such that the state of one particle is dependent upon the state of the other particle, and so the two particles can be considered as a

unitary system (Kennedy 2011: 22). This entanglement is nonlocal because the two particles remain connected even if they become widely separated in space; upon subsequent measurement of the state of one particle, the state of the other is instantly defined (Kennedy 2011: 22). Based on findings suggesting that these microscopic entanglements may scale up to more macroscopic effects, Radin (2006: 2-3) argued that psi may be seen as a concept of "entangled minds"; this would suggest a correlation between minds, rather than any kind of information transfer (Radin 2006: 264). More recently, Clarke (2008: 3) has attempted to "complete modern quantum theory by adding a characterisation of consciousness". However, as with much parapsychological theory, these ideas have met with scepticism from the wider scientific community. Smith (2010: 77) argues that the extrapolation of the theory from particles to human thought is invalid, and also argues that researchers such as Radin (2006) have misunderstood the importance of the term 'entanglement', since it is intended only as a placeholder term to represent the complex mathematics applied to subatomic particles (Smith 2010: 13-14). The key explanation of how individuals ostensibly obtain psi information is therefore still unclear.

6.7. Summary

This review of research has discussed a number of apparently successful studies using physiological measurement, including many utilising EEG and fMRI that appear to show brain activity occurring in relation to stimuli that are either presented to another person, presented but not viewed by another person, or yet to be designated as a 'target'. However, the research also contains a number of null findings, and there are several other important issues to consider; for example, flaws in some of the studies

have been identified, such as small sample sizes and a lack of inferential statistical analyses. Ambach (2008: 145) warns that similar statistical errors to those identified in the work of Wackermann *et al*. (2003) may have affected the findings of other research, meaning that a proportion of the apparently positive results may be spurious. Even if these results are considered as genuine, in several instances it appears that replication has occurred in terms of the finding of an anomalous effect of some kind, but the exact nature of this effect has differed within and between the studies of particular research teams. Due to this inconsistency of findings and lack of an agreed theory, and in response to Ambach's (2008) critique and unsuccessful replication of the findings of Wackermann *et al*. (2003), Wackermann (2008: 151) concluded pessimistically that "it is highly doubtful that there is anything such as a 'real' effect".

Despite Wackermann's (2008: 151) negative outlook, it is perhaps premature to abandon this research area altogether. Although there are inconsistencies in results, there are a sufficient number of positive findings to suggest that ESP may yet be satisfactorily demonstrated with appropriate methodology. Several of the null or unclear findings have been produced by studies that have had small sample sizes, or have not examined certain aspects, such as the full range of EEG frequencies. Additional, well-controlled studies that include these considerations and use larger samples will therefore allow a clearer examination of whether there is a genuine, replicable effect, or whether any apparent effects have been artefacts of methodological or statistical error.

One of the most common issues with much of the research discussed in this chapter is the lack of use of ostensibly psi-conducive experimental paradigms; this is surprising,

particularly in those studies that have attempted to assess a conscious aspect of psi alongside brain activity measurement. Much of the development of such paradigms has been based on assessing conscious psi; for example, the ganzfeld technique is proposed to allow relatively weak psi impressions to be more easily detected (Honorton 1974: 250) and to bring psi information into consciousness through imagery and ideation (Honorton & Harper 1974: 160). Given that psi may operate without conscious awareness (e.g. Stanford 2006: 122), the use of a technique such as the ganzfeld may not be necessary in studies that assess brain activity only. However, it would seem that the use of such a technique would be prudent; if it is capable of demonstrating ESP through conscious responses that require the information to be obtained, move into consciousness along with other non-ESP sensations, and be used to correctly select the target during judging, then one would also expect to be able to identify unconscious responses that do not have to pass through these potentially error-prone phases.

It is therefore apparent that one way in which knowledge can be enhanced in this domain is to perform a study that combines several elements of those discussed. More specifically, there is potential to perform a study of 'conscious psi' using a paradigm that appears to be successful, such as the ganzfeld, in combination with brain activity measurement of both participants and the induction of ERPs in the sender. This would allow assessment of conscious and unconscious psi, in addition to an examination of whether specific brain states of the sender or receiver are more conducive to task success. The next chapter describes such a study.

Chapter 7

Ganzfeld Study Examining Sender-Receiver Relationship and Sex Pairing with EEG Recording and Photic Driving

7.1. Introduction

7.1.1. Rationale

The previous chapter demonstrated a number of key findings regarding EEG and ESP. For example, a relatively large proportion of studies have examined whether ESP task success is related to the alpha frequency band (8-13Hz), since the latter occurs during conditions of physical relaxation and relatively little mental activity (Niedermeyer 1999: 150) that are often related to spontaneous ESP experiences (Irwin & Watt 2007: 38). However, findings are mixed and a consistent relationship between ESP task success and alpha has not been demonstrated. The strong focus on the alpha band has neglected other potential bands of interest; Palmer (1978: 128) proposed that, given that hypnagogic states may be ESP-conducive, one may expect to find a relationship between ESP task success and the theta frequency band (4-7Hz) that is prominent in states of drowsiness (Niedermeyer 1999: 163). The research team of Don, McDonough and Warren has been the most active in terms of examining frequency bands other than alpha, but the majority of their studies have used single participants, and again findings are inconsistent (Don *et al*. 1989, Don *et al*. 1990, Don *et al*. 1996, McDonough, Don & Warren 1989, McDonough, Warren & Don 1989, McDonough *et al*. 1994, McDonough *et al*. 1996, Warren & Don 1987). There is therefore much

potential for further examination of other frequency bands, particularly theta, with larger samples.

The focus on the alpha band may also explain the mismatch between the relative success of the ganzfeld technique and the mixed findings relating to EEG, given that the ganzfeld is proposed to induce a hypnagogic state (Wackermann *et al*. 2002: 125), further suggesting that the theta band may be of more importance than alpha. However, in a study of twelve participants Wackermann *et al*. (2002) found that the average EEG spectrum in the ganzfeld was more similar to that of a relaxed waking state than that of hypnagogia; in addition the ganzfeld condition showed a significant shift of the alpha peak to higher frequencies relative to the relaxed waking condition, indicating higher activation of alpha (Wackermann *et al*. 2002: 132). A subsequent study by the same research team (Pütz, Braeunig & Wackermann 2006), examining seven participants selected for their ability to generate well-structured visual imagery, suggested that while ganzfeld stimulation induced pronounced alpha activity, the higher frequency alpha activity was specifically related to the occurrence of hallucinatory imagery, which appeared to reflect retrieval and transformation of memory content (Pütz *et al*. 2006: 174-176). These researchers thus identified that subjectively similar imagery may be observed in different brain states, and proposed that while the term "hypnagogic" should be reserved for states associated with sleep onset, the term "hypnagoid" may be a useful broader term for the hypnagogic state and other states, such as that induced by ganzfeld stimulation, that produce similar imagery (Wackermann *et al*. 2002: 142).

From the work of Wackermann and colleagues it would thus appear that ganzfeld stimulation promotes alpha activity rather than the assumed theta. Whilst alpha activity best occurs with the eyes closed (Niedermeyer 1999: 150), Pütz *et al*. (2006: 175) draw attention to the work of Lehtonen and Lehtinen (1972), who demonstrated that a uniform visual field produces a comparable level of alpha activity to eye closure, following an initial delay; the uniform pink visual field of the typical ganzfeld setup would therefore be expected to produce a similar effect. However, there are other considerations in a full ganzfeld ESP trial that may be important in determining the mental state, and thus the EEG activity, of the participant. In a typical ganzfeld trial, the receiver is asked to report out loud any images or impressions as they occur (Palmer 2003: 54); this requirement for continuous verbalisation is likely to prevent the receiver from becoming too drowsy during the trial, and thus the likelihood of enhanced theta rhythms is reduced. In addition, while receivers are asked to keep their eyes open (e.g. Pütz *et al*. 2006: 168), it is plausible that receivers who become tired during the trial may close them, unknown to the experimenter who cannot see their eyes through the hemispheres, and this may then quicken the onset of drowsiness and the enhancement of theta rhythms. Counter-intuitively, then, receivers who are less prone to experiencing spontaneous imagery in the eyes-open state are likely to verbalise their impressions less frequently, and may therefore be more likely to become drowsy and experience true hypnagogic imagery.

The ganzfeld study reported in Chapter 5 did not require receivers to verbalise their impressions during the trial; instead they were asked to relax fully and attempt to recall their impressions afterwards. While this may have allowed the occurrence of more hypnagogic imagery, this could not be demonstrated without EEG recording. It

was also acknowledged that this procedure introduced the possibility of receivers forgetting impressions; this was not especially problematic for the receivers, whose memories were often refreshed when they viewed certain aspects of the targets and decoys, but it was more of a problem for the independent judges who were then required to rank the targets and decoys based on incomplete information. However, the study also provided an unexpected opportunity to examine another aspect of the ganzfeld procedure, namely the use of the hemispheres. All receivers were encouraged to use these and keep their eyes open as in the standard procedure, but 19 of the 60 receivers declined; these receivers were therefore asked to close their eyes, which would still produce the necessary uniform pink visual field. The eyes-closed receivers obtained a slightly superior mean target rank compared to the eyes-open receivers, but this difference was not significant. This suggests that the use of the hemispheres does not provide a clear advantage over simple eye closure, so the use of the latter method may be examined further for its potential to induce a hypnagogic state without any undue concerns that this may lead to lower ESP scoring.

In addition to the search for psi-conducive brain states, the previous chapter also established that brain responses to visual stimuli, such as flashes of light (visual evoked potentials, VEPs), have been found to ostensibly transfer from senders to receivers (Charman 2006); this seemingly demonstrates an unconscious aspect of ESP, in comparison to the conscious awareness of visual imagery and other impressions that occurs in the ganzfeld. While VEPs can be produced from a single flash, longer trains of flashes, or 'photic stimulation' (Richardson & McAndrew 1990: 382), presented to open or closed eyes, have been demonstrated to produce changes in dominant EEG frequencies characteristic to the frequency of the flashes; this may be

termed ‘photic driving’ (Charman 2006: 6). As discussed in Chapter 6, Targ and Puthoff (1974) attempted to produce photic driving in their receivers by stimulating their senders with 10-second trains of flashes at either 6Hz or 16Hz. None of the receivers showed evidence of driving in response to flash stimulation of the senders, but the researchers reported that all receivers showed driving when physically stimulated with the flashes (Targ & Puthoff 1974: 606). However, these researchers measured EEG from the Oz site only, causing doubt as to whether this can be considered as photic driving rather than simply a series of responses to visual stimuli in the visual cortex. Other non-parapsychological studies have demonstrated more widespread photic driving effects with longer flash trains; for example, Glicksohn (1986) found evidence of driving at the P4 site with 60-second periods at a flash frequency of 10Hz, while Dieter and Weinstein (1995) found the effect in prefrontal, frontal, central, parietal and occipital regions with 30-minute periods at a frequency of 1.6Hz. Interestingly, in the latter case, participants remained awake despite their EEG activity being in the delta range normally associated with deep sleep (Hume 2003: 72).

Hume (2003) used photic driving on receivers in the ganzfeld, instead of the usual uniform visual stimulation, and found some evidence of greater ESP hitting with frequencies of 5Hz and 10Hz than with 15Hz. Thus, frequencies in the theta and alpha ranges appeared to produce more success than a frequency in the beta range, but Hume did not record the EEG of his participants and so could not be sure that photic driving had taken place. Although Hume used photic driving on receivers, findings of apparently transferred VEPs using short trains of flashes suggest that one could perform longer periods of photic driving on senders and observe an equivalent

response in receivers; if short trains of brain responses are able to be transferred via ESP, it is reasonable to examine whether this can occur with longer responses.

In general, research examining EEG and ESP contains some intriguing findings that are suggestive of an anomalous process, but the database is marked by inconsistency. It is possible that this inconsistency may be due to weaknesses of the research, rather than the non-existence of ESP; for example, much research examining frequency bands has focussed only on a single band, while sample sizes in many studies have been small. Furthermore, few of the studies have used an ostensibly psi-conducive experimental paradigm, such as the ganzfeld. There is therefore a clear need to improve on past research by conducting studies with sufficiently large sample sizes, using ostensibly psi-conducive methodology and examining all of the main EEG frequency bands, whilst assessing conscious and unconscious aspects of ESP. The present study was therefore designed to achieve this aim, in addition to allowing a replication of the study reported in Chapter 5.

7.1.2. Justification for Methodology

The present study was designed to examine whether photic driving of senders would have an effect on the EEG of receivers in the ganzfeld environment, and whether this would correspond with the receiver's improved identification of the target stimulus. Based on the desire for receivers to enter the drowsy theta state where true hypnagogic imagery may occur, receivers were asked to close their eyes rather than use the hemispheres. This change to the standard ganzfeld procedure was designed to induce the theta state more effectively, to minimise the occurrence of eye blink

artefacts on the EEG trace, and to minimise participant discomfort from having numerous pieces of equipment attached to their head and face; this was planned before the non-significantly superior results for eyes-closed trials in the earlier study became apparent. Photic stimulation of the senders was set at 6Hz, at the midpoint of the theta band; approximately half of the senders experienced this for the duration of the trial, allowing comparison with trials with no such stimulation. EEG equipment was available to perform monopolar readings simultaneously on both participants. Given the visual nature of a flashing light stimulus, previous research examining small numbers of electrode sites has tended to focus on the occipital region (e.g. Targ & Puthoff 1974), due to the presence of the primary visual cortex (Andreassi 1995: 20). However, given the present study's focus on theta rhythms, the Fz site was used due to the frontal midline's association with theta rhythms in states of drowsiness (Takahashi *et al*. 1997: 49) and internalised attention (Aftanas & Golocheikine 2001: 59), which were expected to be induced in the receivers due to ganzfeld stimulation.

Following the study reported in Chapter 5, an automated computer system was created that enabled triggering of the EEG recording equipment. This also allowed another change to the procedure, namely the use of video clips as targets, rather than picture postcards, due to the system's ability to randomise and display the clips without the need for an additional researcher to perform randomisation. Watt (1989: 99) suggested that targets should be psychologically and physically salient; the movement, complexity and more life-like nature of video clips compared to pictures would therefore seem to satisfy these requirements, and some studies have demonstrated greater hit-rates with dynamic targets compared to static targets (e.g. Bem & Honorton 1994: 12, Sherwood & Roe 2003: 89). The present study also

attempted a replication of the previous one, with a larger sample size; the effects of the sender-receiver relationship and sex pairing on task success were examined, using the QECR to obtain a measure of each participant's emotional closeness to the other.

7.1.3. Hypotheses

The previous study obtained a number of results that were in the hypothesised directions, but were non-significant. Due to the use of a larger sample size and potentially more psi-conducive targets, it was expected that these results would reach significance in the present study. A series of hypotheses were made, as follows:

- It was hypothesised that the target video clip would be ranked 1st (a 'direct hit') significantly more often than mean chance expectation (MCE, 25%), and likewise that the target video clip would be ranked 1st or 2nd (a 'binary hit') significantly more often than MCE (50%).
- It was hypothesised that non-stranger pairings would score significantly more highly in terms of target rankings (i.e. a lower number) than stranger pairings.
- For non-stranger pairings, negative relationships were hypothesised between the ranking given to the target and i) the receiver's QECR score, ii) the sender's QECR score and iii) the mean QECR score of the pairing, such that rankings would generally be higher (a lower number) for the more closely connected pairings. In line with Schouten's (1983: 332) suggestion that the probability of becoming the percipient in a spontaneous case is higher for the individual who is more emotionally dependent on the other person, it was hypothesised that the relationship between the target ranking and the receiver's QECR score (i.e.

measuring how close the receiver felt to the sender) would be stronger than the relationship between the target ranking and the sender's QECR score (i.e. measuring how close the sender felt to the receiver).

- In line with the findings of Dalton (1994) and Hume (2003) it was hypothesised that mixed-sex pairings would perform better than same-sex pairings, but that this would be primarily due to better performance by romantic couples.
- For senders, a time*EEG band*photic driving interaction was hypothesised. That is, for senders without photic driving it was hypothesised that their EEG would differ little during the trial; however, for senders with photic driving it was expected that power in the theta band would increase during the trial in comparison to the other bands. It was also hypothesised that this effect would lead to an EEG band*photic driving interaction, due to the relatively higher theta power over the duration of photic driving trials.
- For receivers, a time*EEG band interaction was hypothesised, where power in the theta band would increase during the trial in comparison to the other bands. A time*EEG band*photic driving interaction was also hypothesised, where receivers whose senders experienced photic driving would undergo a more pronounced increase in theta over time than the other receivers. As with senders, it was hypothesised that this effect would also manifest in an EEG band*photic driving interaction, due to the relatively higher theta power over the duration of photic driving trials.
- For senders and receivers, a time*EEG band*direct hitting interaction, and a time*EEG band*binary hitting interaction, were hypothesised. That is, for all participants, it was hypothesised that hitting trials would show greater increases in theta band power during the trial than would missing trials. It was further

hypothesised that these effects would lead to EEG band*direct hitting and EEG band*binary hitting interactions, due to the relatively higher theta power over the duration of hitting trials.

7.2. Method

7.2.1. Design

The study used a mixed design since examination was made of the hit-rate across all participants, differences between groups, and relationships between variables. The following were the independent variables:

- Sender-receiver relationship category (between-groups, 4 levels: stranger, friend, family, romantic).
- Sex pairing (between-groups, 4 levels: male sender-male receiver, male-female, female-male and female-female).
- Use of photic driving on the sender (between-groups, 2 levels: on and off).
- Time period (within-groups, 4 levels: baseline, first ten minutes, second ten minutes, third ten minutes).
- EEG band (within-groups, 4 levels: delta, 1 to <4Hz; theta, 4 to <8Hz; alpha, 8 to <13Hz; beta, 13 to <30Hz).

As in Chapter 5, the rank (1 to 4) assigned to the target was one dependent variable, with a rank of 1 designated as a ‘direct hit’ and a rank of 1 or 2 designated as a ‘binary hit’. This rank was also used as a variable in correlation analyses, along with

the sender's QECR score, the receiver's QECR score, and the mean QECR score of the pairing, as measures of relationship closeness (for non-stranger pairings only). Average EEG band power was also a dependent variable, measured in μV^2.

7.2.2. Participants

Ethical approval was obtained from the Coventry University Ethics Committee (see Appendix A) before the study began and before any potential participants were contacted. Participants were an opportunity sample of volunteers, consisting of psychology students and staff from Coventry University as well as some of their friends or family members who were brought as testing partners. These participants were obtained through poster advertisements in the University's psychology department, a listing on the students' research participation website, and by word of mouth. Most of the psychology students took part for research participation credit, whilst the other participants took part out of their own interest.

The sample consisted of 80 participants (40 pairings) in total. There were 26 males and 54 females, ranging in age from 18 to 63 years (mean = 24.1, SD = 10.0). Three participants did not provide their ages. The pairs consisted of 4 all-male pairings, 18 all-female pairings and 18 mixed-sex pairings. Seven pairings were strangers, 23 pairings were friends, 2 pairings were siblings and 8 pairings were romantic partners.

7.2.3. Materials

The pairings were tested in the ganzfeld testing rooms in the James Starley building in Coventry University, as described in Chapter 5. Following the previous study a CCTV camera had been fitted to the receiver's room, allowing the experimenter to view the receiver on a monitor for additional security.

One hundred 60-second colour video clips, with sound, were used as targets. These were available as computer files and pre-arranged into 25 sets of 4 such that no two videos in the same set contained similar content. These clips had been used in previous parapsychological research, including Dalton's (1997) ganzfeld study that obtained a 47% direct hit-rate, and consisted of scenes from films and nature documentaries. Some clips had been edited to ensure that the content was more uniform than in the original version of the film; for example, in several instances the clip showed only one character from a scene in which others were present in the full unedited scene. One of the video files was corrupted and was therefore replaced with a different clip with similar content. Example screenshots of video content are included in Appendix M.

The ganzfeld materials were largely identical to those described in Chapter 5. However, as discussed earlier, translucent hemispheres were not used and receivers kept their eyes closed for the duration of the trial. The sender's room contained a chair, a table and a computer monitor on which the target video was displayed; the sound for the video was played through headphones. An LED strobe light set to flash at 6Hz was set up next to this monitor, facing towards the sender. The main room

light was switched off during the trial, to avoid distractions for the sender and to enhance the effectiveness of the strobe light.

The EEG recordings of both participants were made using Biopac Student MP30 units. EEG electrodes were attached in order to provide a monopolar reading from the Fz (frontal midline) site, with readings from the left mastoid and supraorbital ridge as references. An automated computer system was developed that was able to trigger the EEG recordings at the beginning of the trial; this system also randomly selected the set and target video clip for the trial, began playing the clip to the sender in synchrony with the EEG recording, and presented the four clips from the set to the receiver, in a random order, after they had come out of the ganzfeld environment. Brain Electrical Source Analysis (BESA) software was used to analyse the EEG traces.

The slightly modified version of the QECR (Schmidt *et al*. 2001; see Appendix F) was used, as in Chapter 5. Due to the inclusion of the strobe light, participants also completed a short medical questionnaire (see Appendix K) enquiring as to any history of epilepsy, head injury, sensitivity to bright or flickering lights and any other relevant health issues.

7.2.4. Procedure

Participants were given a thorough description of what would occur during the study, both in writing (see Appendix J) and verbally, allowing them to give fully informed consent. They were also told that they had the right to withdraw from the study at any time. When they were ready to proceed, the participants decided which members of

the pairing would be the sender and receiver for the first trial. They were then taken to the appropriate rooms, each supervised by a researcher. The author was present at each trial, accompanied by a second, female researcher.

Both participants were set up in their separate rooms. The receiver sat in the comfortable chair, while the sender sat in an ordinary classroom chair in front of their monitor. EEG electrodes were attached to both participants, and the headphones were placed on their heads; testing prior to the beginning of the study demonstrated that the EEG trace appeared to be unaffected by the wearing of these headphones. A baseline measurement was then recorded for each participant, for a period of five minutes. For receivers, this involved closing their eyes whilst in darkness. For senders, this involved keeping their eyes open in a lit room. These baseline conditions differed since they were intended to measure EEG activity in a similar state to the experimental state, only without the stimulation (ganzfeld stimulation for the receiver, stroboscopic stimulation and video footage with sound for the sender). Thus, any changes from baseline could be determined as being due to the experimental stimulation. Both participants were asked to remain as still as possible, and senders were asked to blink as infrequently as they were comfortable with, to avoid producing an excessive number of artefacts on the EEG trace.

Following this baseline recording, the trial was initiated. The receiver's red lamp was switched on, and they were asked to close their eyes, relax and let any images, thoughts, feelings or emotions come to them during the trial. The sender was asked to view the video clip and use any technique they wished in order to attempt to 'send' the contents to the receiver; as in the baseline recording period they were asked to

remain as still as possible and blink only when necessary to remain comfortable. The receiver's experimenter retired to their section of the two-part room, and was able to view the receiver using the CCTV system. The sender's experimenter remained in the sending room with the sender; both participants were therefore fully observed throughout the trial, preventing any possibility of cheating.

The relaxation procedure and automated system were started simultaneously. The latter triggered a countdown to be displayed on the screen viewed by the sender; this countdown was the same length as the relaxation procedure played to the receiver, i.e. five minutes and thirty seconds. Following this period, the system displayed a randomly selected video clip to the sender, with sound, while simultaneously triggering the EEG recording of both participants to begin; this coincided with the transition to pink noise for the receiver. The video clip then played to the sender on a loop, playing thirty times in total over a thirty minute period. Pink noise was played to the receiver throughout this time. On approximately half of the trials, the strobe light was switched on for the duration of the trial. Senders were informed that if they found this uncomfortable they could ask the experimenter to switch it off at any point; this only occurred on one occasion. The strobe was not used if senders expressed a desire to perform the trial without it, or if their answers to the medical questionnaire indicated any potential problems. As such, the selection of senders to use the strobe could not be fully randomised, since priority had to be given to those senders who were able to use it.

At the end of the trial, both participants were disconnected from the EEG apparatus. The receiver was brought out of the ganzfeld environment, and was asked to describe

all of their impressions during the trial. This was recorded on the voice recorder for use in later independent judging. The receiver's experimenter then triggered the automated system to play the four video clips from the appropriate set, in a randomised order. The receiver was asked to rank the clips in order of how well they represented their imagery, thoughts, feelings and emotions during the trial. Once this process was complete, both participants completed the QECR (for non-stranger pairings only), and the researchers and participants then convened to discover the true identity of the target. Participants were allowed a short break if they desired, following which they swapped sender/receiver roles, and the whole procedure was repeated. The automated system ensured that the video clip set used in the first trial was not used again in the second trial. After the second trial the participants were given a thorough debriefing and thanked for their participation.

Following the completion of the testing of all 40 pairings, the judging of the similarity of the receivers' mentation to the targets and decoys was repeated for all 80 trials by three independent judges, using the recordings obtained from the voice recorder. These judges were not otherwise involved in the study, and had no contact with each other during the judging period.

EEG data were analysed using BESA software. All eye blink and other artefacts were identified and removed manually from all traces. Each trial's trace was separated into three ten-minute periods, to allow analysis of changes during the trial. A Fast Fourier Transform (FFT) algorithm was applied to each trace, to provide the average power in each of the main EEG frequency bands (delta: 1 to <4Hz; theta: 4 to <8Hz; alpha: 8 to <13 Hz; beta: 13 to <30Hz) for the baseline and the three ten-minute periods, for each

participant for each trial. The FFT used two-second 'blocks' to ensure the delta frequencies would be detected (using the rule of thumb of block length = 2 ÷ minimum frequency).

7.3. Results

7.3.1. Randomisation Checks

A number of randomisation checks were performed, and no problems were demonstrated in this respect. No sets (1-25) were selected significantly more often than the others (χ^2 (24, N = 80) = 17.50, p = .827), no targets (A-D) were selected significantly more often than the others (χ^2 (3, N = 80) = 6.70, p = .082), and there was no tendency for a specific target to be selected more often within a set (Fisher's exact test, p = .846). To check that there were no patterns in the sequence of targets, it was examined whether there was a tendency for a particular target to follow another target, for example if target B was more often followed by target C, irrespective of the set; no such sequences were found (Fisher's exact test, p = .715). This analysis could not be performed to examine any sequence of sets, due to the small numbers involved; there were 625 possible permutations of sequential sets, but only 80 trials. However, inspection of the data revealed no concerns.

The target was not in any positions for judging more often than the others, for receivers or judges (receiver: χ^2 (3, N = 80) = 5.10, p = .165; judge 1: χ^2 (3, N = 80) = 1.60, p = .659; judge 2: χ^2 (3, N = 80) = 1.30, p = .729; judge 3: χ^2 (3, N = 80) = 4.70, p = .195), and receivers and judges showed no bias towards any positions while

judging (receiver: χ^2 (3, N = 80) = 2.50, p = .475; judge 1: χ^2 (3, N = 80) = 3.70, p = .296; judge 2: χ^2 (3, N = 80) = 5.40, p = .145; judge 3: χ^2 (3, N = 80) = 3.70, p = .296). There was no tendency for a particular target position to follow another target position, for receivers or judges (Fisher's exact test; receiver: p = .586; judge 1: p = .724; judge 2: p = .181; judge 3: p = .992).

7.3.2. Receiver Judging

As in Chapter 5, all of the following analyses regarding the receivers' judging of their own trials were planned in advance of the trials taking place, to avoid the problem of using multiple analyses or multiple indices of success until a significant result was found. All p-values presented are two-tailed.

Due to the use of rank data, and the non-independence of scores owing to participants all taking part in two trials, all analyses conducted on non-EEG data were non-parametric. As explained in Chapter 5, medians and interquartile ranges are therefore presented, as is custom with non-parametric analyses, but the small range of ranks assigned to targets has in some instances led to identical medians despite some apparent differences between the groups in terms of hit-rates. The means and standard deviations are therefore also reported as these provide indications of slightly more subtle differences between groups.

For analyses of direct hits and binary hits a Bonferroni correction was applied due to the use of two indices of success, as per the recommendations of Hyman and Honorton (1986: 358); the alpha level was therefore adjusted to .025 to account for

the conducting of two similar analyses (Field 2013: 69). There were 20 direct hits from the 80 trials, a hit-rate of 25.00%, which was equal to MCE and therefore not significant: $z = 0.00$, $p > .999$, $\pi = .500$. There were 47 binary hits, a hit-rate of 58.75%. This was above the MCE of 40 hits but was not significant: $z = 1.59$, $p = .112$, $\pi = .588$.

The results split by sex pairing are shown in Table 7.1. Male-male pairings performed best with regard to direct hits, binary hits and mean target rank, while female-female pairings performed least well. Generally, there appeared to be better success with male receivers than with female receivers. However, the medians were identical for all four pairing types, and a Kruskal-Wallis test showed there to be no significant difference between the pairing types in terms of the ranking given to the target: $H = 1.098$, $df = 3$, $p = .778$, $\eta^2 = .014$. The group sizes were rather unbalanced, but the number of trials in each group was greater than 5, meaning that the Kruskal-Wallis test should not be adversely affected (McDonald 2013); however, a larger number of male-male pairings would have been desirable to give a potentially more representative set of results for this type of pairing.

The results split by categorised sender-receiver relationship are shown in Table 7.2. Stranger pairings performed best on direct hits, while siblings performed best on binary hits, although there were only four trials including this type of pairing; strangers also scored well on binary hits, while friend pairings performed least well overall. Again, however, the medians were identical for all four pairing types, and a Kruskal-Wallis test showed there to be no significant difference between the relationship categories in terms of the ranking given to the target: $H = 0.931$, $df = 3$, p

= .818, η^2 = .012. In this instance, the number of trials involving siblings was below 5, suggesting that the results for this type of pairing may not be representative of sibling performance, but also violating the sample size requirement for the Kruskal-Wallis test (McDonald 2013). As a precautionary measure, the test was therefore performed whilst excluding the sibling pairings, to examine any differences between the three other types of pairing; the result remained non-significant: $H = 0.850$, $df = 2$, $p = .654$, $\eta^2 = .011$.

Table 7.1. Direct hits, binary hits, median target rank and mean target rank, split by sex pairing (receiver judging).

Sender Sex	Receiver Sex	Trials	Direct Hits	Direct Hit-Rate (%)	Binary Hits	Binary Hit-Rate (%)	Median Target Rank (IQR)	Mean Target Rank (SD)
Female	Male	18	5	27.78	11	61.11	2.0 (2.0)	2.28 (1.07)
Male	Female	18	4	22.22	10	55.56	2.0 (2.0)	2.44 (1.10)
Female	Female	36	8	22.22	20	55.56	2.0 (2.0)	2.50 (1.13)
Male	Male	8	3	37.50	6	75.00	2.0 (3.0)	2.13 (1.25)

Table 7.2. Direct hits, binary hits, median target rank and mean target rank, split by sender-receiver relationship category (receiver judging).

Relationship Category	Trials	Direct Hits	Direct Hit-Rate (%)	Binary Hits	Binary Hit-Rate (%)	Median Target Rank (IQR)	Mean Target Rank (SD)
Romantic	16	4	25.00	10	62.50	2.0 (2.0)	2.31 (1.08)
Sibling	4	1	25.00	3	75.00	2.0 (2.0)	2.25 (1.26)
Friend	46	11	23.91	24	52.17	2.0 (2.0)	2.50 (1.13)
Stranger	14	4	28.57	10	71.43	2.0 (2.0)	2.21 (1.12)

For analyses of QECR scores the alpha level was adjusted to .017 using a Bonferroni correction, to account for the conducting of three similar analyses. Individual QECR scores of the 66 non-stranger participants ranged from 43.08 to 96.30 (mean = 74.10, SD = 12.20). Mean QECR scores of the 33 pairings ranged from 56.30 to 95.19 (mean = 74.10, SD = 10.50). Kendall's tau correlation analysis was performed to examine the relationship between the ranking given to the target and the receiver's QECR score (i.e. the strength of the receiver's closeness to the sender); the relationship was very weak, positive and non-significant: $\tau = .064$, $N = 66$, $p = .494$. The relationship between the ranking given to the target and the sender's QECR score (i.e. the strength of the sender's closeness to the receiver) was near-zero, positive and non-significant: $\tau = .004$, $N = 66$, $p = .963$. The relationship between the ranking given to the target and the mean QECR score of the pairing (i.e. the overall closeness of the pairing) was very weak, positive and non-significant: $\tau = .041$, $N = 66$, $p = .662$. All of these analyses therefore demonstrated that closer bonding corresponded with poorer performance, but to a very weak and non-significant degree. The relationship between the ranking given to the target and the receiver-to-sender bond was stronger than the relationship between the ranking given to the target and the sender-to-receiver bond, as hypothesised, but the relationship directions were not as hypothesised and the difference between the relationships was not significant: $t_{obt}(63) = 0.42$, $p = .676$.

The strobe was used in 38 trials (including the trial in which the participant asked for it to be switched off at the midpoint of the trial); these trials produced 9 direct hits (23.68%) and 25 binary hits (65.79%), with a median target rank of 2.0 (IQR = 2.0) and a mean target rank of 2.37 (SD = 1.13). The 42 trials in which the strobe was not used produced 11 direct hits (26.19%) and 22 binary hits (52.38%), with a median

target rank of 2.0 (IQR = 2.0) and a mean target rank of 2.43 (SD = 1.11). Compared to non-strobe trials, strobe trials therefore produced a higher proportion of binary hits and a slightly higher mean rank, but a slightly lower proportion of direct hits. However, the medians were identical and a Mann-Whitney U test demonstrated that the difference between these two types of trial was not significant: U (N_1 = 38, N_2 = 42) = 771, p = .787, r = .030.

7.3.3. Independent Judging

Direct hits, binary hits, median target rank and mean target rank for each independent judge are shown in Table 7.3, along with the receiver results for comparison. All judges scored slightly above MCE for direct hits, in comparison to the participants who scored exactly at MCE. However, the participant scored highest above MCE for binary hits, with two judges scoring below MCE. None of these results were significant.

Table 7.3. Direct hits, binary hits, median target rank and mean target rank for receiver and independent judges.

Judge	Direct Hits (Rate/%)	Binary Hits (Rate/%)	Median Target Rank (IQR)	Mean Target Rank (SD)
Receiver	20 (25.00)	47 (58.75)	2.0 (2.0)	2.40 (1.11)
Judge 1	21 (26.25)	41 (51.25)	2.0 (3.0)	2.48 (1.14)
Judge 2	24 (30.00)	39 (48.75)	3.0 (2.0)	2.44 (1.15)
Judge 3	21 (26.25)	33 (41.25)	3.0 (3.0)	2.63 (1.17)

Direct hits and binary hits for each independent judge, split by sex pairing, are shown in Table 7.4, along with the receiver results for comparison. There was very little consistency between the receivers' and judges' results; the best agreement was regarding the around-MCE direct hitting of male sender-female receiver pairings. There was some agreement between the three judges, particularly regarding binary hitting for the mixed-sex pairings; the judges obtained identical, below-MCE scoring, in contrast to the receivers' results, which were slightly above MCE. All three judges also scored slightly above MCE for direct hitting of the female-female pairings, in contrast to the receivers' slightly below-MCE scoring. Judge 2 obtained a significantly above-MCE result for direct hitting of male-male pairings.

Direct hits and binary hits for each independent judge, split by sender-receiver relationship category, are shown in Table 7.5, along with the receiver results for comparison. As with the sex pairing findings, there was little consistency between the receivers' and judges' results; there was some agreement regarding the around-MCE binary hitting of friend pairings and the around-MCE direct hitting of romantic pairings. The three judges all scored slightly above MCE for direct hitting of friend pairings, in contrast to the receivers' slightly below-MCE scoring; they also all scored below MCE for binary hitting of romantic pairings, in contrast to the receivers' slightly above-MCE scoring. Judge 3 obtained a significantly below-MCE result for binary hitting of stranger pairings.

Table 7.4. Direct hits and binary hits for receiver and independent judges, split by sex pairing.

Sender Sex	Receiver Sex	Trials	Receiver Direct Hits (Rate/%)	Judge 1 Direct Hits (Rate/%)	Judge 2 Direct Hits (Rate/%)	Judge 3 Direct Hits (Rate/%)	Receiver Binary Hits (Rate/%)	Judge 1 Binary Hits (Rate/%)	Judge 2 Binary Hits (Rate/%)	Judge 3 Binary Hits (Rate/%)
Female	Male	18	5 (27.78)	2 (11.11)	4 (22.22)	5 (27.78)	11 (61.11)	8 (44.44)	7 (38.89)	7 (38.89)
Male	Female	18	4 (22.22)	5 (27.78)	4 (22.22)	4 (22.22)	10 (55.56)	8 (44.44)	7 (38.89)	7 (38.89)
Female	Female	36	8 (22.22)	12 (33.33)	11 (30.56)	11 (30.56)	20 (55.56)	23 (63.89)	20 (55.56)	17 (47.22)
Male	Male	8	3 (37.50)	2 (25.00)	5 (62.50)**	1 (12.50)	6 (75.00)	2 (25.00)	5 (62.50)	2 (25.00)

Table 7.5. Direct hits and binary hits for receiver and independent judges, split by sender-receiver relationship category.

Relationship Category	Trials	Receiver Direct Hits (Rate/%)	Judge 1 Direct Hits (Rate/%)	Judge 2 Direct Hits (Rate/%)	Judge 3 Direct Hits (Rate/%)	Receiver Binary Hits (Rate/%)	Judge 1 Binary Hits (Rate/%)	Judge 2 Binary Hits (Rate/%)	Judge 3 Binary Hits (Rate/%)
Romantic	16	4 (25.00)	4 (25.00)	3 (18.75)	4 (25.00)	10 (62.50)	7 (43.75)	6 (37.50)	6 (37.50)
Sibling	4	1 (25.00)	1 (25.00)	1 (25.00)	2 (50.00)	3 (75.00)	2 (50.00)	3 (75.00)	2 (50.00)
Friend	46	11 (23.91)	13(28.26)	15 (32.61)	13 (28.26)	24 (52.17)	25 (54.35)	23 (50.00)	22 (47.83)
Stranger	14	4 (28.57)	3 (21.43)	5 (35.71)	2 (14.29)	10 (71.43)	7 (50.00)	7 (50.00)	3 (21.43)**

Key: Asterisked values indicate hit-rates significantly above MCE with two-tailed tests (* $p < .025$, ** $p < .01$, *** $p < .001$).

Using intraclass correlations, agreement between the three judges was shown to be significant and weak-to-moderate (intraclass r = .349, $F(79, 158) = 2.609$, $p < .001$), whilst including the receiver along with the judges lowered the strength of agreement to a weak level (intraclass r = .291, $F(79, 237) = 2.640$, $p < .001$). Receivers and judges were therefore agreeing to a significant degree, but there were sufficient areas of disagreement to have a relatively large impact on the results in terms of the apparent relative performance of the different subgroups of participants.

7.3.4. Combined Results

The receiver-judged direct and binary hits from the two studies were combined to examine whether there were any overall effects across the two studies. There were 40 direct hits from the 140 trials; this gave a direct hit-rate of 28.57%, which was not significant (Stouffer $Z = 1.07$, $p = .285$). However, there were 85 binary hits; this gave a binary hit-rate of 60.71%, which was significantly above MCE (Stouffer $Z = 2.64$, $p = .008$).

7.3.5. Notable Hits and Notable Misses

As in the previous study, the use of independent judges allowed examination of 'notable hits', i.e. trials in which the receiver and all three independent judges obtained a direct hit, indicating a strong correspondence between the receiver's impressions and the target video, relative to the decoys. There was only one notable hit in the present study, which is described below. Note that the mentation summary is edited slightly to enhance readability, but all of the key features are retained.

Notable hit 1 (trial 26, female-female, friends, strobe used, mean QECR score 62.17, set 8, target D): "I think there was something about a car, and I think there was an old man as well, and people's faces. There was maybe a sort of 1920s theme, like a 1920s club with dancers. There was maybe some water; I didn't see it but got the 'vibe'."

The target video was a clip from the song *Money, Money*, performed by Liza Minnelli and Joel Grey in the 1972 film *Cabaret*. The film is set in 1931, and the scene takes place in a cabaret club. Thus, this is a very close match to the '1920s club' reported by the receiver (see Appendix M).

The use of independent judges also allowed examination of 'notable misses', i.e. trials in which the receiver and all three independent judges ranked a particular decoy in first position, indicating a strong correspondence between the receiver's impressions and this decoy, relative to the actual target and the other two decoys. There were ten notable misses; one is presented below, with the remainder presented in Appendix L.

Notable miss 1 (trial 10, male-female, romantic, strobe used, mean QECR 85.93, set 16, target A, decoy C chosen): "The pink noise sounded so much like the sound on the coast, the seaside and the wind; it reminded me of that so it triggered images and memories of those scenes. I thought I could see sandy textures as if looking down on the beach or at beach sunsets. There were flashes of imagery but one thing was clear; it wasn't that I was looking at sand but more like I was looking at something that had a sand-like texture, not gravel but finer than gravel, that kind of texture. Then I had images of being on a boat, or seeing boats on the water. Then I got a glimpse of looking into something that had a round shape to it; it reminded me of looking down

the front of a cannon barrel. Then I got a glimpse of a woman who was almost cartoony, wearing a coat or a fur cape, a fancy kind of coat. I saw a dog that ran diagonally towards me; this was also cartoon-like. I must have been drifting off, because I was getting images of wandering round the shopping centre in Milton Keynes, which is what we were doing yesterday. From about halfway through part of my hands felt really quite cold, an icy cold feeling like I was putting them under running water. This wasn't on my face and I didn't get goosebumps, just the sensation of being cold or being exposed on my skin."

The target video clip was a scene from the 1967 film *You Only Live Twice* in which James Bond, played by Sean Connery, shoots down a series of helicopters whilst flying an armed autogyro. This matches the receiver's impressions to some extent since the scene takes place above mountains with a sandy and gravelly texture. The chosen decoy was documentary footage of marine iguanas on rocks; the sound of crashing waves can be heard although there is very little footage of water. The narration discusses the fact that the iguanas are cold and need to warm up in the sun. There are therefore a number of the receiver's impressions that can be matched to this decoy, including the non-visual aspect of feeling cold during the trial.

7.3.6. EEG Analyses

7.3.6.1. Data Screening

The EEG data were screened before analysis. Some trials contained extensive muscle movement and eye blink artefacts, whilst in others one or more electrodes became detached during the trial due to participant movement; trials were excluded if these

issues caused there to be no usable EEG data in either the baseline recording or in any of the three ten-minute periods of the trial. This led to the removal of trials for 18 senders and 18 receivers. For the remaining trials, the average EEG power data were highly positively skewed, so a natural logarithmic transformation was applied to the data from all frequency bands. Following this transformation, trials containing any outliers with an absolute *z* score exceeding 3.29 for any frequency band were also removed; this led to the removal of trials for an additional 2 senders and 2 receivers. On inspection, these trials also appeared to contain extensive artefacts, suggesting that the removal of this small number of additional trials was justified to ensure that only good-quality EEG data were retained in the analysis. Following screening, EEG data therefore remained for 60 senders and 60 receivers, with 74 trials represented in total.

7.3.6.2. All Senders

A 4 (time period) x 4 (EEG frequency band) within-groups ANOVA was conducted for the senders. Helmert contrasts were performed for the time period IV, allowing comparison of baseline with the trial as a whole, comparison of the first ten minutes of the trial with the last twenty minutes of the trial, and comparison of the second ten minutes of the trial with the last ten minutes of the trial. (For brevity, henceforth the three ten-minute segments of the trial will be referred to as period 1, period 2 and period 3). Simple contrasts were performed for the EEG frequency band IV, comparing theta with each of the other bands. Since a simple contrast is non-orthogonal a Bonferroni correction was applied for this part of the analysis, reducing the alpha level to .017 to allow for the presence of three comparisons using theta. Bonferroni post hoc tests were also performed, comparing all time periods with each

other and all EEG frequency bands with each other, in case any effects could be identified that were not apparent from the planned comparisons. Significance values for Bonferroni tests are already adjusted for multiple comparisons, so the alpha level remained at .05 for these tests.

Figure 7.1 displays the results for this analysis. Mauchly's test of sphericity was violated for all comparisons so Greenhouse-Geisser corrections were used. The main effect of time was marginally non-significant: $F(1.835, 108.265) = 3.084$, $p = .054$, partial $\eta^2 = .050$. Helmert contrasts demonstrated that average power across all bands was higher during period 1 than in periods 2 and 3 combined ($p = .015$), while post hoc Bonferroni tests demonstrated that this effect appeared to be due to a difference between periods 1 and 2 ($p = .025$), but not between periods 1 and 3 ($p = .126$). The main effect of band was significant: $F(1.754, 103.512) = 200.987$, $p < .001$, partial $\eta^2 = .773$. Simple contrasts demonstrated that power in the theta band was lower than delta, but higher than alpha and beta (all $p < .001$).

The interaction between time and band was significant: $F(5.561, 328.103) = 5.417$, $p < .001$, partial $\eta^2 = .084$. Contrasts identified a significant difference ($p = .002$) between the theta and beta bands in terms of their changes from baseline to trial; theta band power decreased more than that of beta. Contrasts also identified a significant difference ($p = .015$) between the theta and delta bands in terms of their changes from period 2 to period 3; while theta band power increased slightly, delta power remained relatively similar.

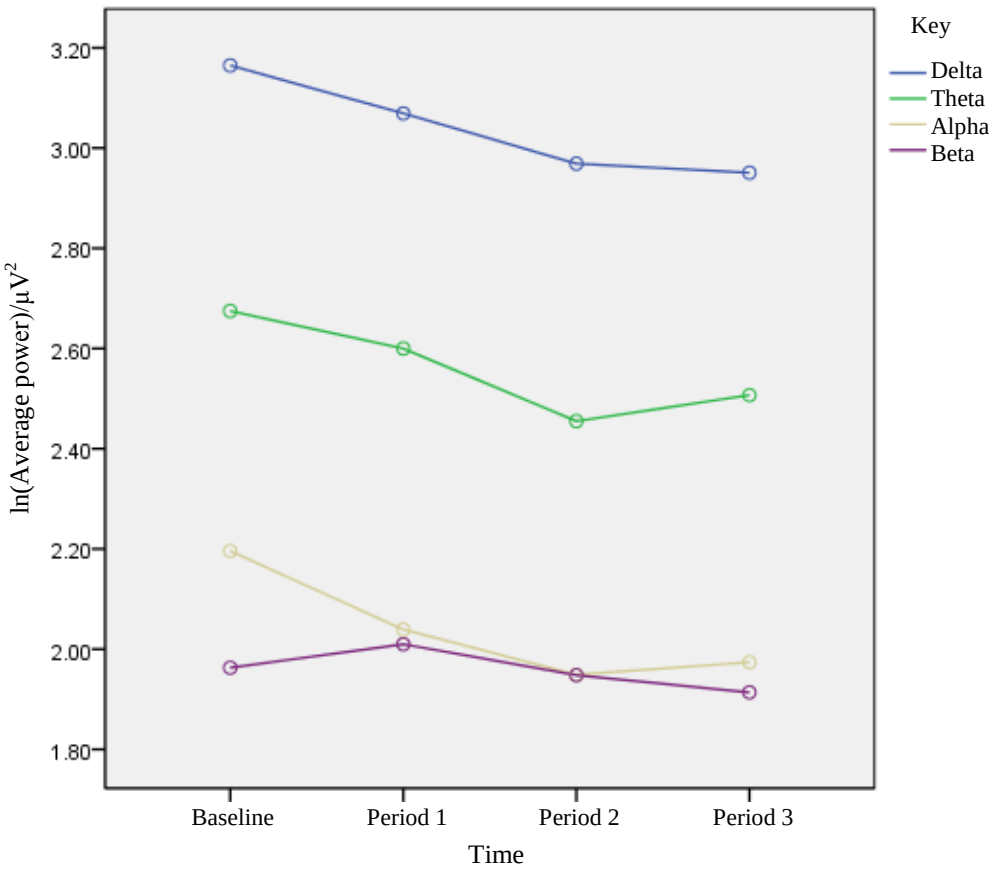

Figure 7.1. Average power (natural logarithm transformed) in sender EEG frequency bands (delta, theta, alpha, beta) during baseline, period 1, period 2 and period 3 of trials.

7.3.6.3. All Receivers

A 4 (time period) x 4 (EEG frequency band) within-groups ANOVA was then conducted for the receivers, with identical contrasts and post hoc tests to the previous analysis. Figure 7.2 displays the results. Mauchley's test of sphericity was violated for all comparisons so Greenhouse-Geisser corrections were used. The main effect of time was significant: $F(1.592, 93.921) = 4.801$, $p = .016$, partial $\eta^2 = .075$. Helmert contrasts demonstrated that average power across all bands was higher during baseline than during the trial as a whole ($p = .015$). The main effect of band was also significant: $F(2.228, 131.469) = 338.815$, $p < .001$, partial $\eta^2 = .852$. Simple contrasts

demonstrated that power in the theta band was lower than delta, but higher than alpha and beta (all $p < .001$).

The interaction between time and band was significant: $F(5.186, 305.963) = 4.497$, $p < .001$, partial $\eta^2 = .071$. Contrasts identified a significant difference ($p = .010$) between the theta and delta bands in terms of their changes from baseline to trial; delta band power decreased more than that of theta.

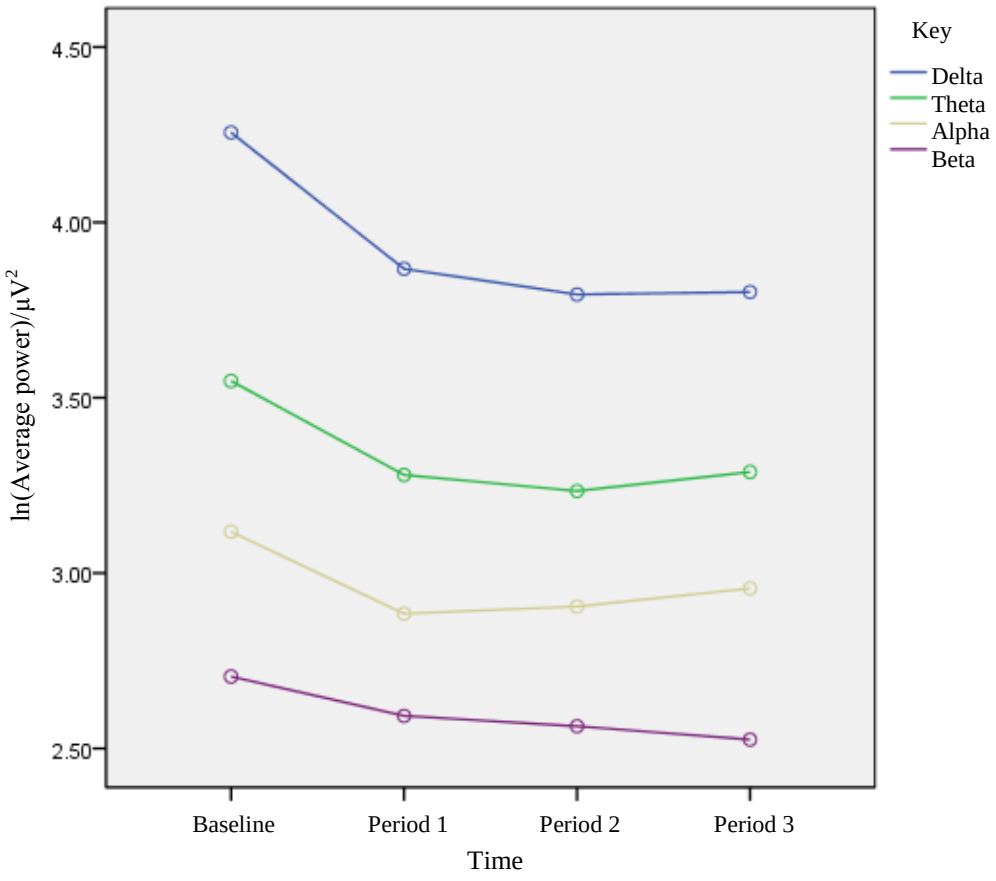

Figure 7.2. Average power (natural logarithm transformed) in receiver EEG frequency bands (delta, theta, alpha, beta) during baseline, period 1, period 2 and period 3 of trials.

7.3.6.4. Effect of the Strobe: Senders

A series of 4 x 4 x 2 mixed ANOVAs were then conducted. As in the previous analyses, time period and EEG frequency band were included as within-groups IVs; Helmert contrasts were performed for the time period IV, simple contrasts were performed for the EEG frequency band IV, and Bonferroni post hoc tests were also performed. Since the main effects of time and band, and the interaction between these variables, have already been reported, these are omitted for the subsequent analyses; the focus of these analyses was on differences between groups and the various interactions between the between-groups and within-groups IVs.

A 4 (EEG frequency band) x 4 (time period) x 2 (strobe usage) mixed ANOVA was conducted for the senders, to examine whether the use of the strobe had any effect on their EEG. This analysis contained 30 senders who had experienced the strobe and 30 who had not. Mauchly's test of sphericity was violated for within-groups comparisons so Greenhouse-Geisser corrections were used. Levene's test for homogeneity of variance was violated for between-groups comparisons, so the alpha level was reduced to a more conservative level of .01 for these analyses only. Figure 7.3 displays the results for senders with the strobe, while Figure 7.4 displays the results for senders without the strobe.

Non-significant results were found for the main effect of strobe usage ($F(1, 58) = 0.433$, $p = .513$, partial $\eta^2 = .007$), the interaction between time and strobe usage ($F(1.836, 106.484) = 0.418$, $p = .642$, partial $\eta^2 = .007$), the interaction between band and strobe usage ($F(1.725, 100.058) = 0.733$, $p = .464$, partial $\eta^2 = .012$) and the interaction between time, band and strobe usage ($F(5.510, 319.574) = 0.725$, $p = .618$,

partial η^2 = .012). Thus, there appeared to be no photic driving effect of the strobe on the sender's EEG. Upon further examination of the contrasts of the time*band*strobe usage interaction, a difference was observed between strobe and non-strobe trials, in terms of the differences in theta and delta power between period 1 and periods 2 and 3 combined. In trials without the strobe, theta power decreased slightly relative to delta, which stayed relatively constant; in trials with the strobe, delta power decreased similarly to theta. This contrast was significant at the .05 level (p = .046), potentially suggesting that the strobe produced some suppression of delta activity. However, the overall interaction effect was not significant and so this must be considered a very speculative interpretation of the results.

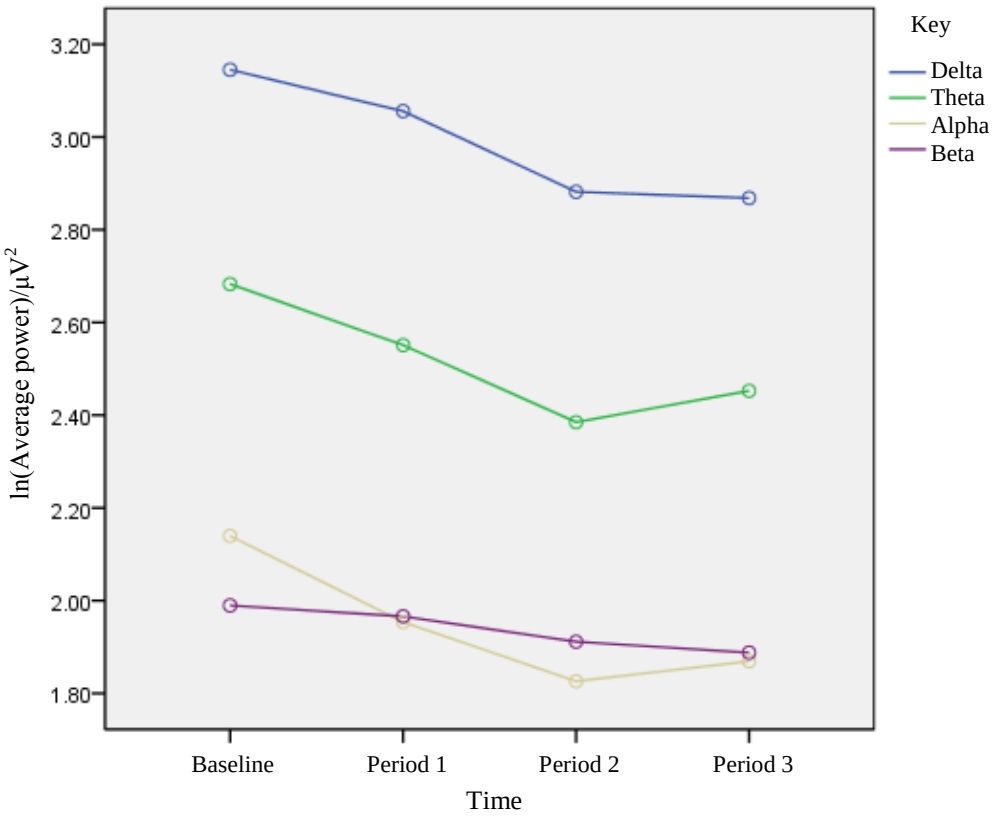

Figure 7.3. Average power (natural logarithm transformed) in sender EEG frequency bands (delta, theta, alpha, beta) during baseline, period 1, period 2 and period 3 of trials with strobe usage.

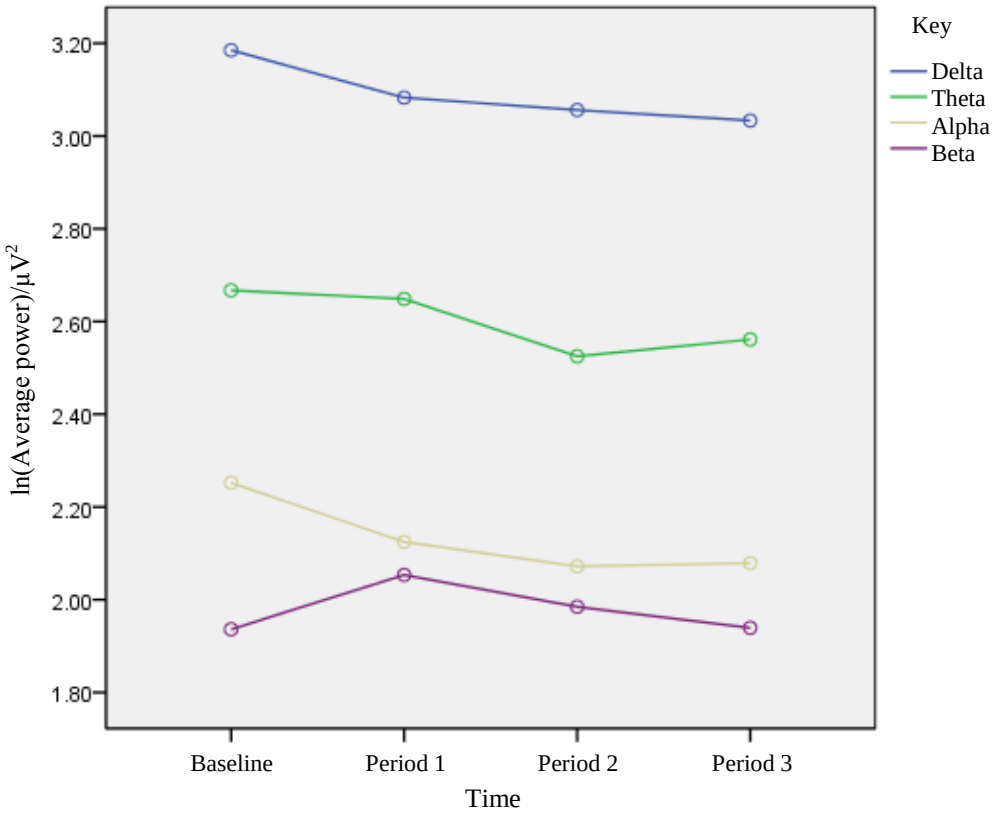

Figure 7.4. Average power (natural logarithm transformed) in sender EEG frequency bands (delta, theta, alpha, beta) during baseline, period 1, period 2 and period 3 of trials without strobe usage.

7.3.6.5. Effect of the Strobe: Receivers

A 4 (EEG frequency band) x 4 (time period) x 2 (strobe usage) mixed ANOVA was conducted for the receivers, to examine whether the use of the strobe on the sender had any effect on the EEG of the receiver. This analysis contained 29 receivers whose sender had experienced the strobe and 31 receivers whose sender had not experienced the strobe. Mauchly's test of sphericity was violated for within-groups comparisons so Greenhouse-Geisser corrections were used. Levene's test demonstrated satisfactory homogeneity of variance for between-groups comparisons. Figure 7.5 displays the results for receivers in trials with strobe usage, while Figure 7.6 displays the results for receivers in trials without strobe usage.

Non-significant results were found for the main effect of strobe usage ($F(1, 58) = 1.544$, $p = .219$, partial $\eta^2 = .026$), the interaction between time and strobe usage ($F(1.578, 91.509) = 0.538$, $p = .544$, partial $\eta^2 = .009$) and the interaction between time, band and strobe usage ($F(5.144, 298.346) = 0.752$, $p = .588$, partial $\eta^2 = .013$). However, the interaction between band and strobe usage was significant ($F(2.297, 133.233) = 3.765$, $p = .021$, partial $\eta^2 = .061$); contrasts demonstrated that the difference in power between the theta and alpha bands was larger in with-strobe trials than without-strobe trials ($p = .008$). This supports the hypothesis of relatively greater theta power in with-strobe trials.

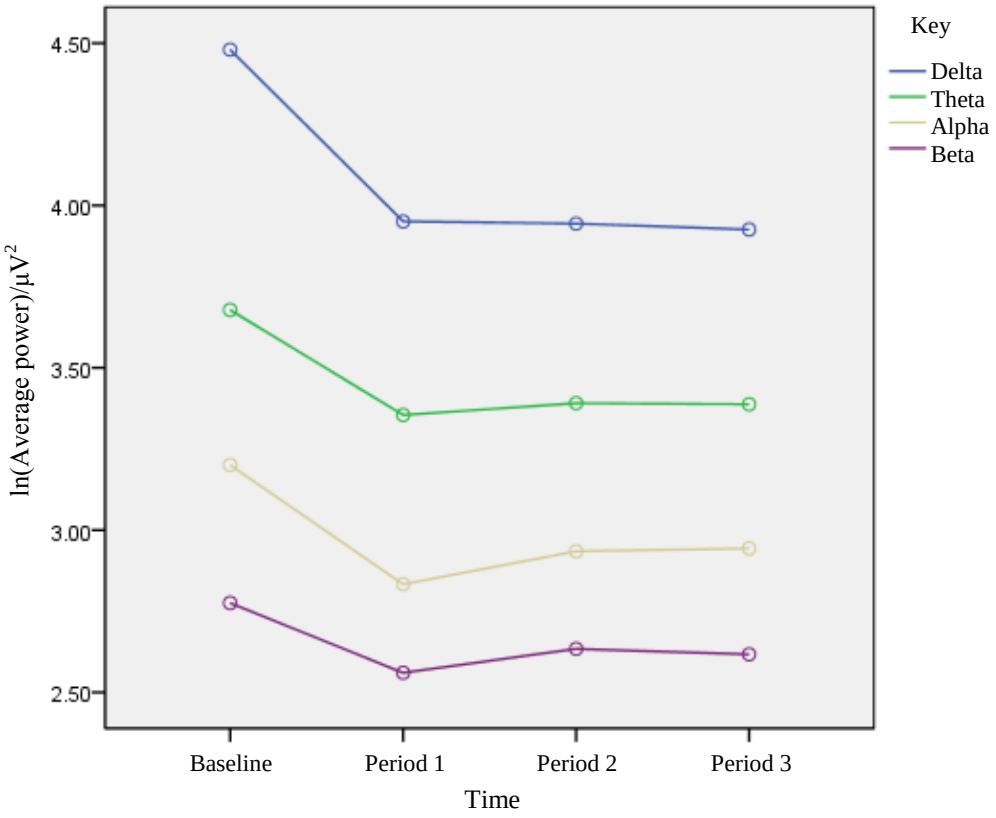

Figure 7.5. Average power (natural logarithm transformed) in receiver EEG frequency bands (delta, theta, alpha, beta) during baseline, period 1, period 2 and period 3 of trials with strobe usage.

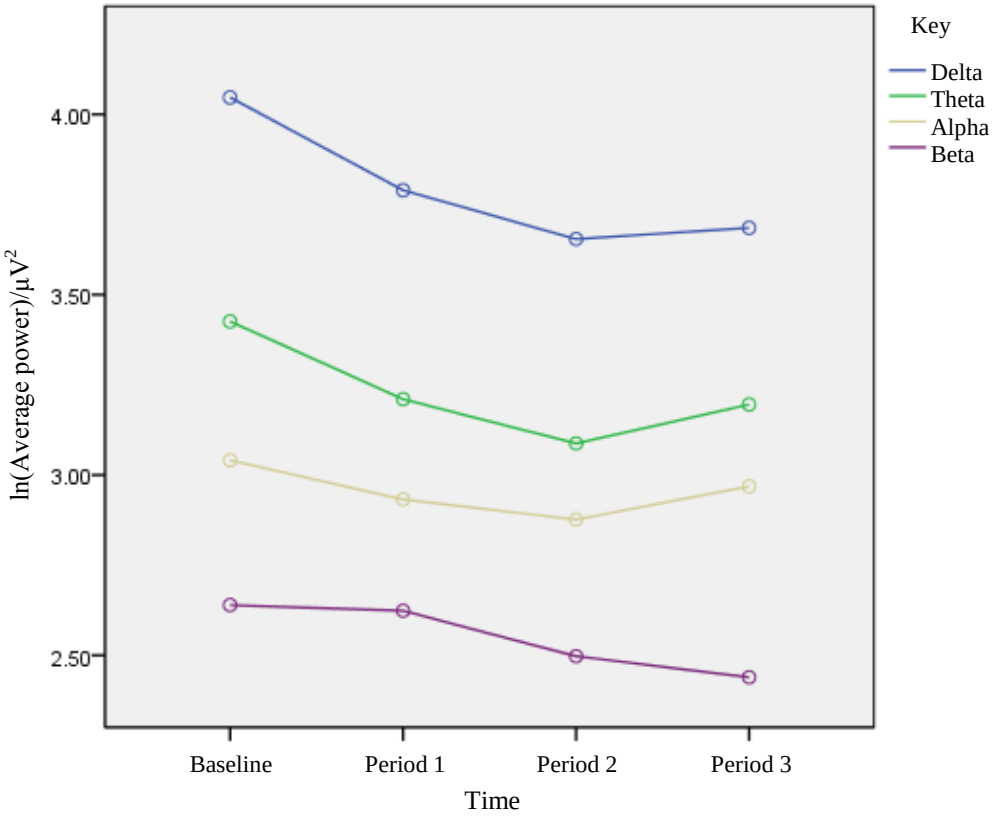

Figure 7.6. Average power (natural logarithm transformed) in receiver EEG frequency bands (delta, theta, alpha, beta) during baseline, period 1, period 2 and period 3 of trials without strobe usage.

7.3.6.6. Direct Hitting: Senders

A 4 (EEG frequency band) x 4 (time period) x 2 (direct hit) mixed ANOVA was conducted for the senders, to examine whether there were any differences in the EEG activity between senders in trials with and without receiver-judged direct hits. This analysis contained 16 senders from direct hit trials and 44 senders from trials without a direct hit. Mauchly's test of sphericity was violated for within-groups comparisons so Greenhouse-Geisser corrections were used. Levene's test demonstrated satisfactory homogeneity of variance for between-groups comparisons. Figure 7.7 displays the results for senders in trials with direct hits, while Figure 7.8 displays the results for senders in trials without direct hits.

There were no significant differences between trials with and without direct hits: $F(1, 58) = 0.135$, $p = .715$, partial $\eta^2 = .002$. Non-significant results were also found for the interaction between time and direct hitting ($F(1.832, 106.251) = 0.220$, $p = .784$, partial $\eta^2 = .004$), the interaction between band and direct hitting ($F(1.744, 101.177) = 0.314$, $p = .701$, partial $\eta^2 = .005$) and the interaction between time, band and direct hitting ($F(5.534, 320.961) = 0.651$, $p = .677$, partial $\eta^2 = .011$). Thus, there were no apparent differences in the sender's EEG between trials with and without receiver-judged direct hits.

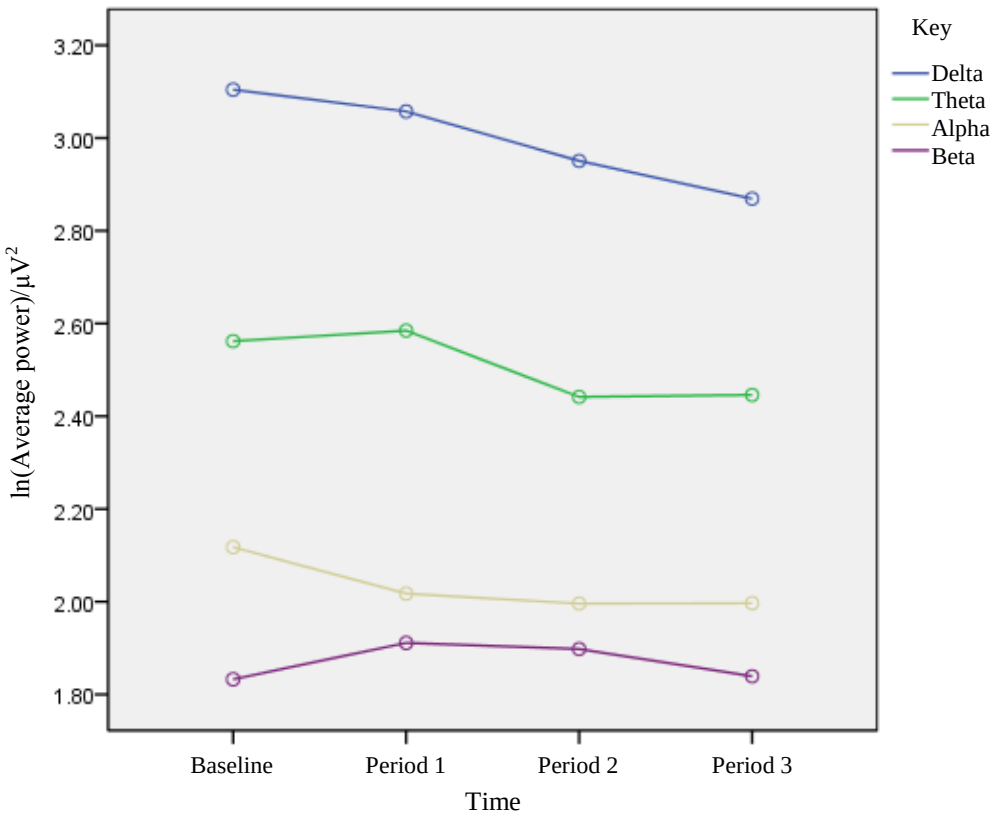

Figure 7.7. Average power (natural logarithm transformed) in sender EEG frequency bands (delta, theta, alpha, beta) during baseline, period 1, period 2 and period 3 of trials with receiver-judged direct hits.

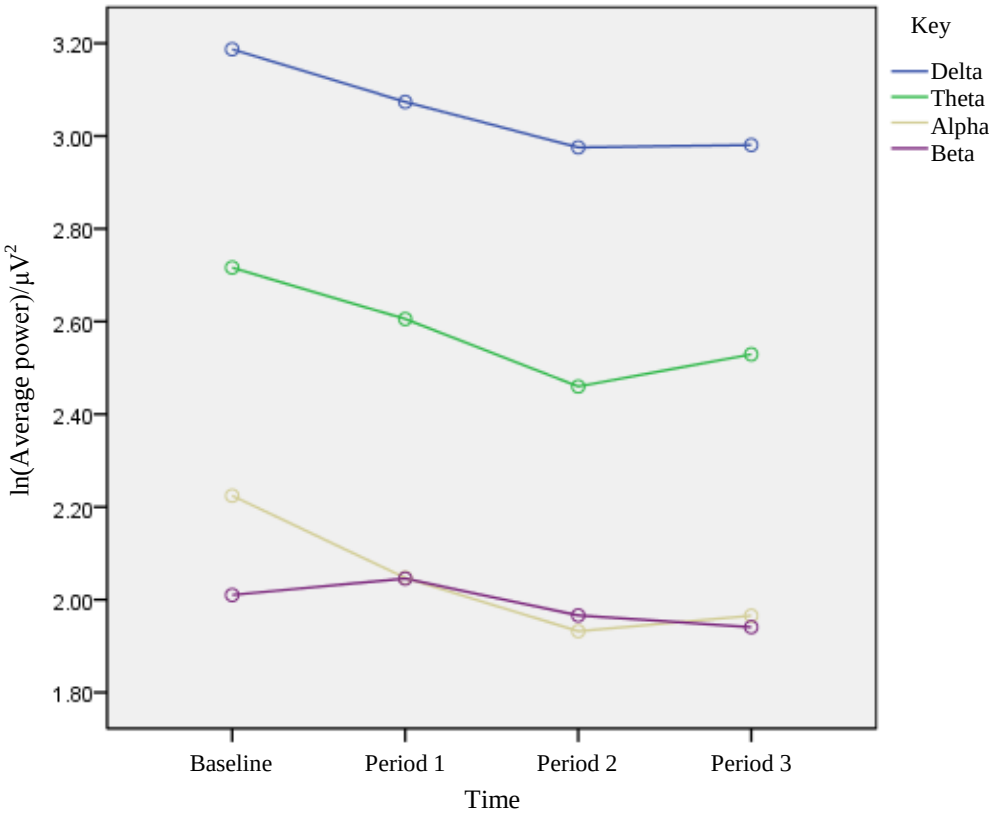

Figure 7.8. Average power (natural logarithm transformed) in sender EEG frequency bands (delta, theta, alpha, beta) during baseline, period 1, period 2 and period 3 of trials without receiver-judged direct hits.

7.3.6.7. Direct Hitting: Receivers

A 4 (EEG frequency band) x 4 (time period) x 2 (direct hit) mixed ANOVA was conducted for the receivers, to examine whether there were any differences in the EEG activity between receivers in trials with and without receiver-judged direct hits. This analysis contained 17 receivers who obtained direct hits and 43 receivers who did not. Mauchly's test of sphericity was violated for within-groups comparisons so Greenhouse-Geisser corrections were used. Levene's test demonstrated satisfactory homogeneity of variance for between-groups comparisons. Figure 7.9 displays the results for receivers in trials with direct hits, while Figure 7.10 displays the results for receivers in trials without direct hits.

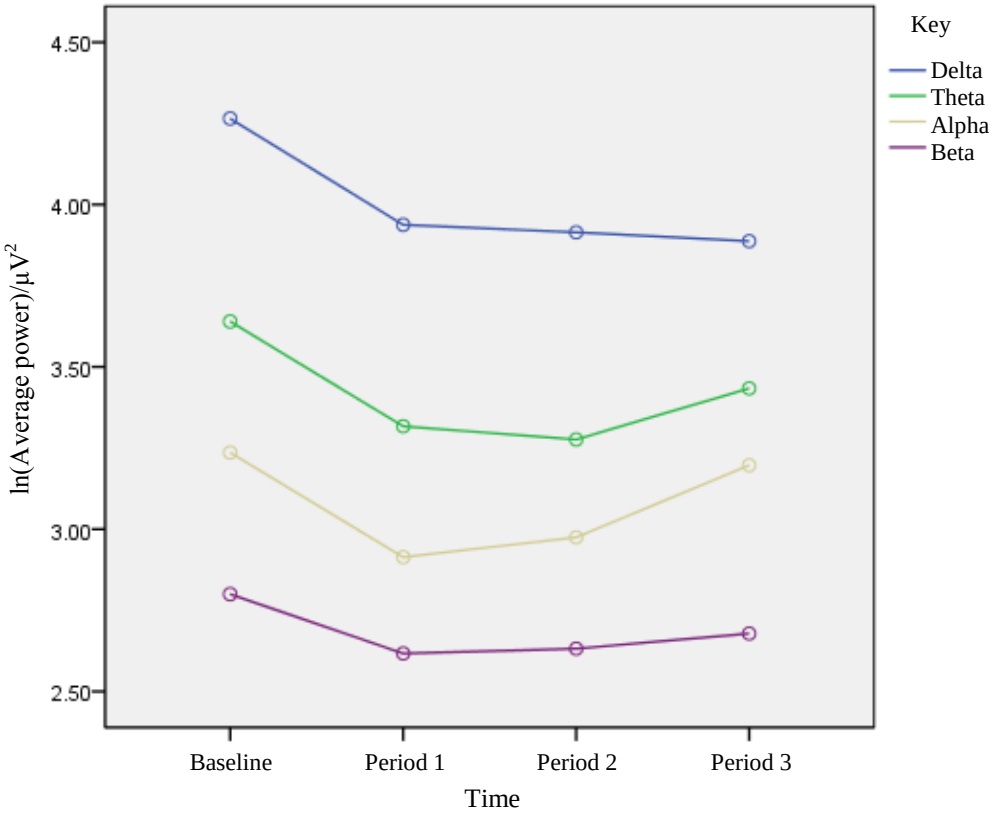

Figure 7.9. Average power (natural logarithm transformed) in receiver EEG frequency bands (delta, theta, alpha, beta) during baseline, period 1, period 2 and period 3 of trials with receiver-judged direct hits.

There were no significant differences between trials with and without direct hits: $F(1, 58) = 0.757$, $p = .388$, partial $\eta^2 = .013$. Non-significant results were also found for the interaction between time and direct hitting ($F(1.582, 91.776) = 0.252$, $p = .725$, partial $\eta^2 = .004$), the interaction between band and direct hitting ($F(2.230, 129.315) = 0.146$, $p = .885$, partial $\eta^2 = .003$) and the interaction between time, band and direct hitting ($F(5.155, 298.991) = 0.782$, $p = .567$, partial $\eta^2 = .013$). Thus, there were no apparent differences between the EEG traces of receivers who obtained direct hits and those who did not. However, from viewing Figures 7.9 and 7.10 it is noteworthy that, for receivers obtaining direct hits, there is an apparent increase in power in the theta and alpha bands between periods 2 and 3 of the trial, whereas for receivers not obtaining

direct hits there is no such increase. Therefore, despite the non-significant results (and the non-significant contrast relating to this specific aspect; p = .089), there is a pattern in the findings that is in line with the hypothesis of hitting being associated with greater theta power.

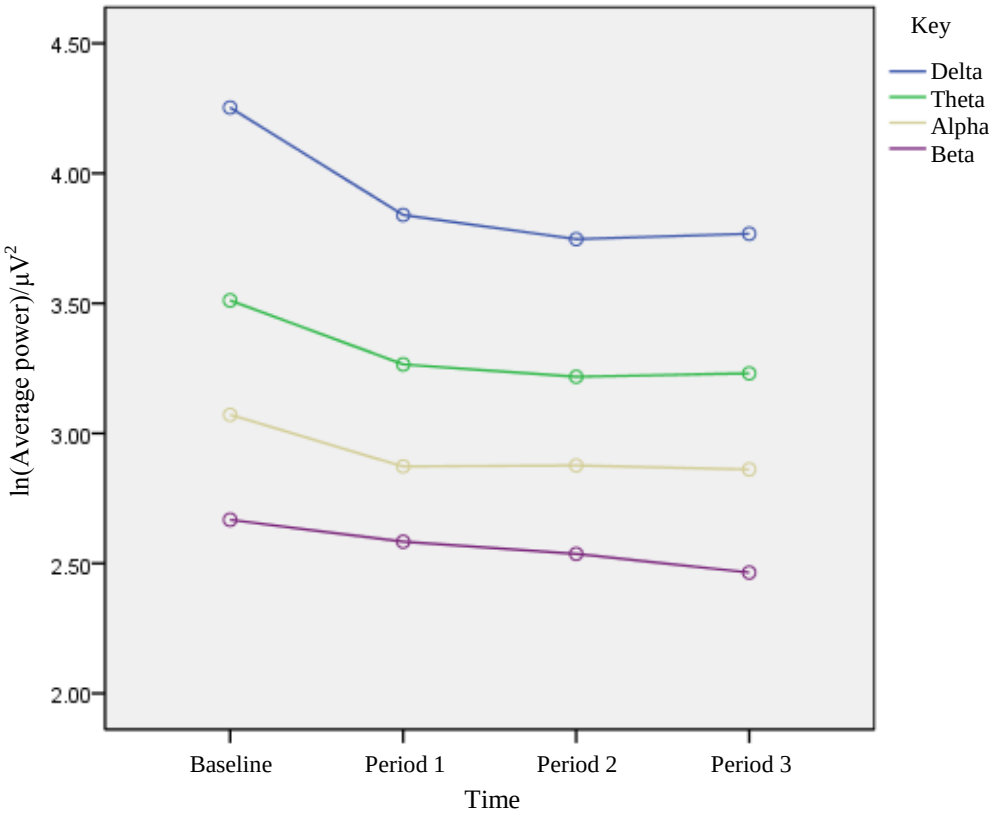

Figure 7.10. Average power (natural logarithm transformed) in receiver EEG frequency bands (delta, theta, alpha, beta) during baseline, period 1, period 2 and period 3 of trials without receiver-judged direct hits.

7.3.6.8. Binary Hitting: Senders

A 4 (EEG frequency band) x 4 (time period) x 2 (binary hit) mixed ANOVA was conducted for the senders, to examine whether there were any differences in the EEG activity between senders in trials with and without receiver-judged binary hits. This analysis contained 38 senders from binary hit trials and 22 senders from trials without

a binary hit. Mauchly's test of sphericity was violated for within-groups comparisons so Greenhouse-Geisser corrections were used. Levene's test demonstrated satisfactory homogeneity of variance for between-groups comparisons. Figure 7.11 displays the results for senders in trials with binary hits, while Figure 7.12 displays the results for senders in trials without binary hits.

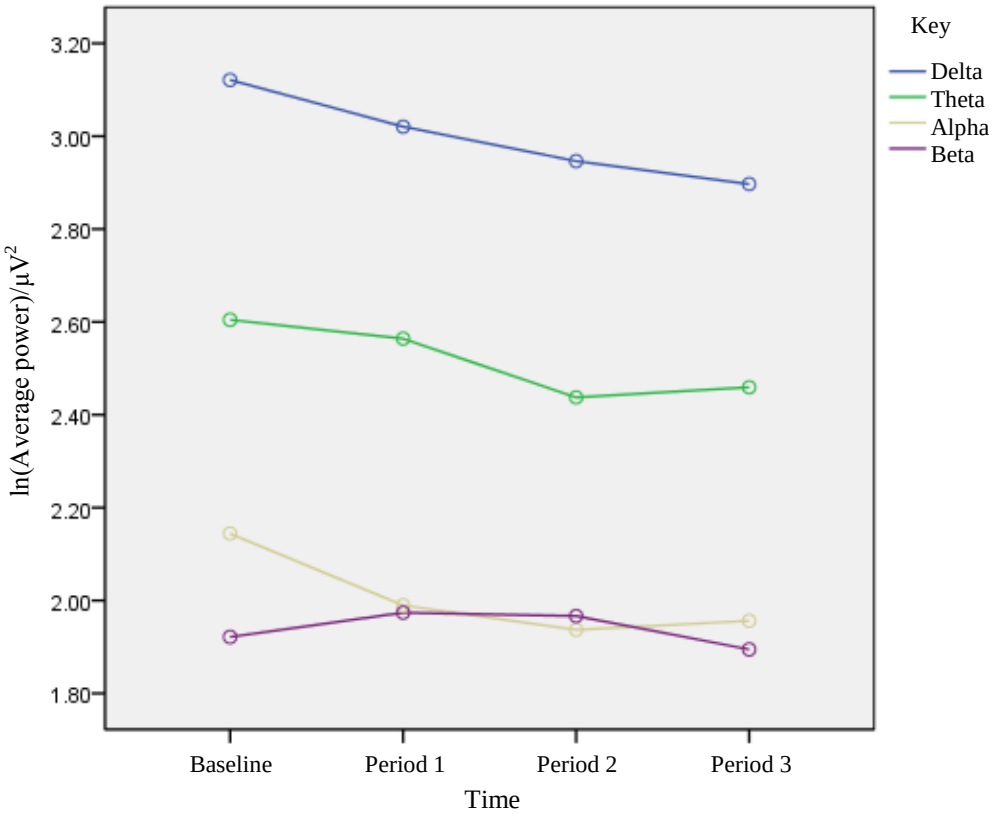

Figure 7.11. Average power (natural logarithm transformed) in sender EEG frequency bands (delta, theta, alpha, beta) during baseline, period 1, period 2 and period 3 of trials with receiver-judged binary hits.

There were no significant differences between trials with and without binary hits: $F(1, 58) = 0.338$, $p = .563$, partial $\eta^2 = .006$. Non-significant results were also found for the interaction between time and binary hitting ($F(1.827, 105.962) = 0.279$, $p = .737$, partial $\eta^2 = .005$), the interaction between band and binary hitting ($F(1.757, 101.892) = 0.164$, $p = .822$, partial $\eta^2 = .003$) and the interaction between time, band and binary

hitting (F(5.532, 320.875) = 0.600, p = .717, partial η^2 = .010). Thus, there were no apparent differences in the sender's EEG between trials with and without receiver-judged binary hits.

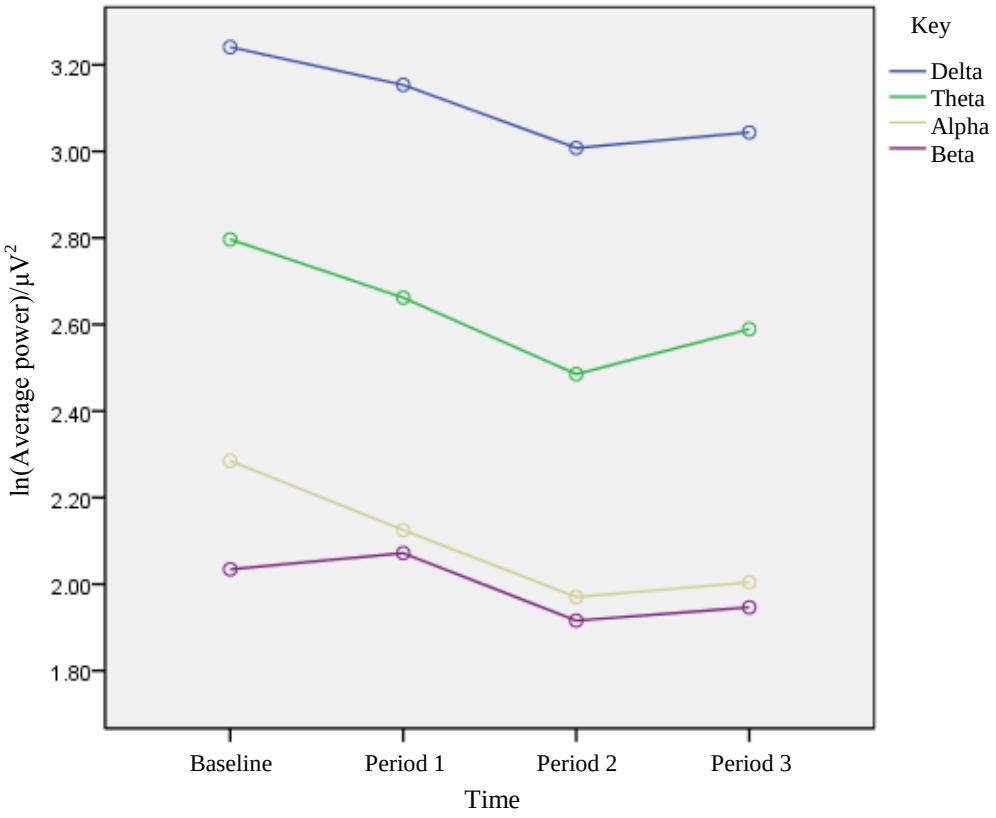

Figure 7.12. Average power (natural logarithm transformed) in sender EEG frequency bands (delta, theta, alpha, beta) during baseline, period 1, period 2 and period 3 of trials without receiver-judged binary hits.

7.3.6.9. Binary Hitting: Receivers

A 4 (EEG frequency band) x 4 (time period) x 2 (binary hit) mixed ANOVA was conducted for the receivers, to examine whether there were any differences in the EEG activity between receivers in trials with and without receiver-judged binary hits. This analysis contained 39 receivers who obtained binary hits and 21 receivers who did not. Mauchly's test of sphericity was violated for within-groups comparisons so

Greenhouse-Geisser corrections were used. Levene's test demonstrated satisfactory homogeneity of variance for between-groups comparisons. Figure 7.13 displays the results for receivers in trials with binary hits, while Figure 7.14 displays the results for receivers in trials without binary hits.

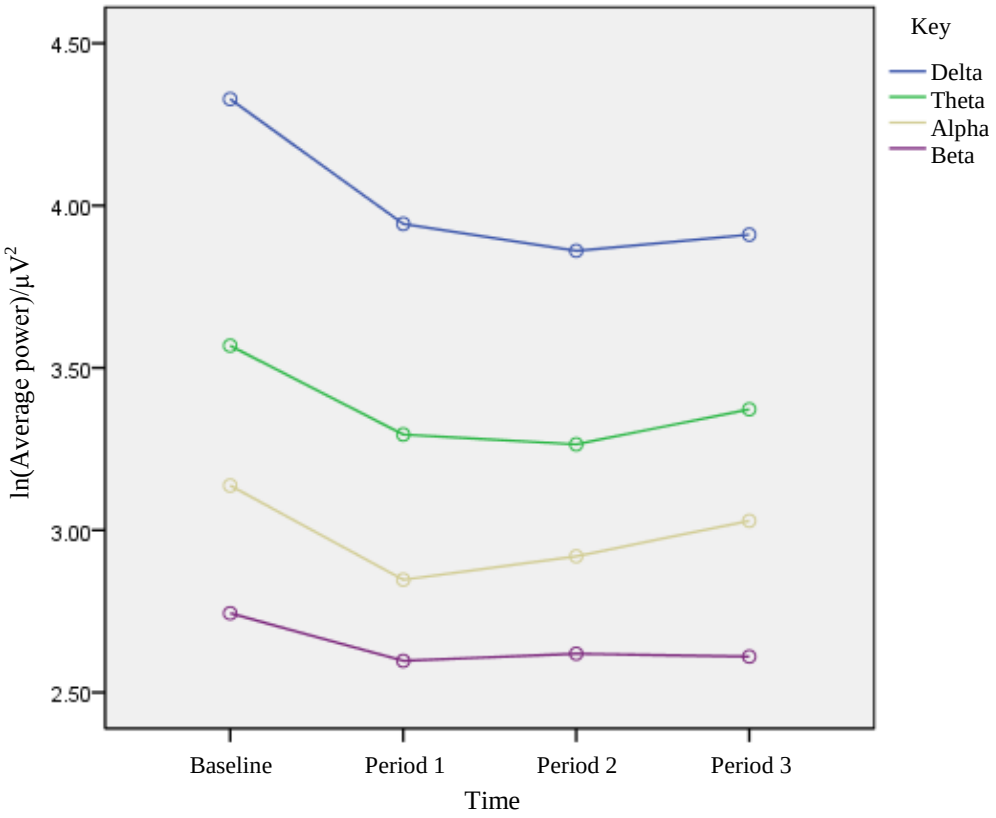

Figure 7.13. Average power (natural logarithm transformed) in receiver EEG frequency bands (delta, theta, alpha, beta) during baseline, period 1, period 2 and period 3 of trials with receiver-judged binary hits.

There were no significant differences between trials with and without binary hits: $F(1, 58) = 0.962$, $p = .331$, partial $\eta^2 = .016$. Non-significant results were also found for the interaction between time and binary hitting ($F(1.575, 91.351) = 0.465$, $p = .584$, partial $\eta^2 = .008$), the interaction between band and binary hitting ($F(2.248, 130.368) = 1.364$, $p = .259$, partial $\eta^2 = .023$) and the interaction between time, band and binary hitting ($F(5.160, 299.295) = 0.439$, $p = .827$, partial $\eta^2 = .008$). Thus, there were no

apparent differences between the EEG traces of receivers who obtained binary hits and those who did not. The pattern identified earlier for direct hits, where there is a noticeable increase in power in the theta and alpha bands between periods 2 and 3 of the trial, is also present for binary hits (Figure 7.13) but to a lesser extent; however, this similar pattern is to be expected given the fact that binary hits also include direct hits.

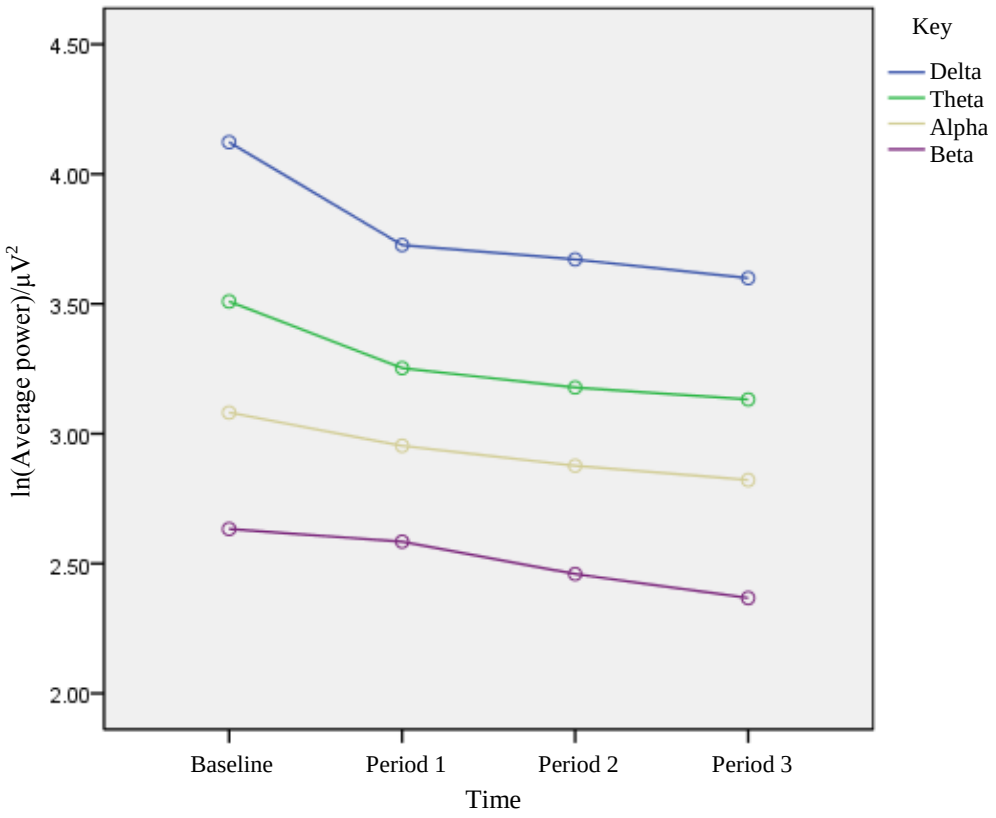

Figure 7.14. Average power (natural logarithm transformed) in receiver EEG frequency bands (delta, theta, alpha, beta) during baseline, period 1, period 2 and period 3 of trials without receiver-judged binary hits.

7.4. Discussion

7.4.1. Summary and Interpretation of Results

The results were largely not as hypothesised, although there were some findings of interest. For receiver judging, direct hitting was at MCE. Binary hitting was above MCE, as in the previous study, but not significantly so. The hypotheses of significantly above-MCE hitting were therefore not supported. When combining the results of both studies, direct hitting was non-significantly above MCE, while binary hitting was significantly above MCE. Thus, across both studies, there is some support for ESP having occurred; participants ranked the target video first or second more often than would be expected by chance. However, the significant direct hitting of previous ganzfeld research, such as the pre-PRL database (Bem 1994: 25) and the PRL studies (Bem & Honorton 1994), was not replicated.

The previous study obtained non-significant results that suggested a slight advantage for romantic pairings and pairings with higher self-reported connectedness to each other, but these findings were not replicated in the present study. There was no apparent advantage for romantic pairings, with strangers performing best overall, and none of the closeness measures were related to the target ranking; the relationships were very weak and in the opposite direction to that hypothesised. The suggestion that more closely bonded pairings would be more likely to demonstrate ESP was therefore not supported; neither was there any experimental result corresponding with Schouten's (1983: 332) suggestion that the probability of becoming the percipient in a spontaneous case is higher for the individual who is more emotionally dependent on the other person. This inconsistency in the results of the two studies suggests that

there is no meaningful relationship between pairing closeness and ESP task success, and the apparent advantage for close pairings in the first study may have been fortuitous; this also corresponds with the inconsistent findings obtained in other research, as discussed in Chapter 4. It is possible that, in laboratory studies at least, sender-receiver relationship strength does not affect ESP task success, or may interact with a number of other variables such as belief in the paranormal (e.g. Lawrence 1993), extraversion (e.g. Parra & Villanueva 2003) and creativity (e.g. Dalton 1997, Schlitz & Honorton 1992). Future research may therefore benefit from measuring pertinent variables such as these in conjunction with sender-receiver relationship strength.

The results also did not follow those of the previous study in terms of sex pairing. The results from the earlier study, although non-significant, followed the general pattern of findings by Dalton (1994) and Hume (2003) in that mixed-sex pairings performed better than same-sex pairings, seemingly due largely to the tendency for higher scoring in the romantic pairings. However, the results of the present study did not follow this pattern and so were not as hypothesised; for example, male-male pairings performed best overall, having performed worst overall in the previous study. Again, this inconsistency in results suggests that there is no meaningful association between sex pairing and ESP task success, and corresponds with the inconsistent findings obtained in other research (Schmeidler 1994: 152). Overall, these findings are therefore more in line with Schouten's (1983: 330) argument that, based on his observations from spontaneous case research, males and females do not differ in ESP ability. However, given the overall null findings in terms of ESP, it is perhaps unsurprising that there are no significant results in terms of sender-receiver

relationship or sex pairing; if the obtained hits are mostly or entirely due to chance, one would not expect to find meaningful correlates of these hits.

Results varied across the three independent judges; analysis of inter-rater reliability demonstrated a significant intraclass correlation, but with only weak-to-moderate strength. Similarly to the previous study, despite there being significant agreement between the judges, and between the judges and receivers, there was sufficient disagreement to lead to differences in the apparent relative performance of the subgroups of participants. As discussed earlier, low agreement between receivers and judges may in some instances have been due to the lack of a verbalisation requirement during the trial; this may have led to receivers forgetting impressions, in which case judges were required to rank the targets and decoys based on incomplete mentation reports. However, this may also be due to a lack of occurrence of ESP, in which case the mentation would have consisted of a variety of disparate thoughts, feelings and impressions, making the judgement process more difficult and leading to increased disagreement.

Whilst the inter-rater reliability measure takes account of the rankings given to all targets and decoys, a number of trials were identified for which the receivers and judges agreed on the video clip to be ranked in first position. As introduced in Chapter 5, trials with complete agreement on the correct (target) video have been termed ‘notable hits’, while those with complete agreement on an incorrect (decoy) video have been termed ‘notable misses’. In Chapter 5 it was proposed that, by chance alone, one may expect to obtain three times as many notable misses as notable hits. Whilst the previous study fared well on this measure, with four notable hits and three

notable misses, the present study obtained only one notable hit and ten notable misses. Across both studies, then, the ratio of five hits to thirteen misses is only slightly above the chance level. Whilst it is not necessarily the case that the ratio of notable hits to notable misses should be used as an alternative index of success in ESP studies, this analysis is intended as an illustration of the potential problems with presenting only notable hits in study reports. It is potentially misleading to present impressive correspondences between mentation and targets as examples of possible ESP, when there are equally impressive correspondences between mentation and decoys. Nevertheless, it is noteworthy that, as in the previous study, the notable hit was obtained by a female-female friend pairing with an unremarkable mean QECR score; if it may tentatively be suggested that ESP is more likely to have occurred in trials producing notable hits, then this result further suggests that the sender-receiver relationship may not be an important factor in ESP task success, or potentially suggests an advantage for all-female pairings. However, since female-female friend pairings were the majority in both studies, the prevalence of these pairings in obtaining notable hits may perhaps have been expected to occur by chance.

The EEG results were also largely not as hypothesised, but contained some findings of interest. Analysis of all senders demonstrated a decrease in power across all bands from period 1 to period 2 of the trial. This was unexpected and may be an artefact; for example, despite requests to avoid excessive blinking, a number of senders blinked frequently. It is plausible that senders blinked especially rapidly in the early stages of the trial while they were acclimatising to viewing the illuminated computer screen in the darkness of the room, and to viewing the strobe light in the trials in which it was used. Despite careful removal of eye blink artefacts from the data it is possible that

some residual evidence of muscle movement remained, producing artificially high values for period 1 of the trial. Although this may potentially be problematic, the fact that this has affected all bands means that analysis of relative changes between bands is still possible. To this end, analysis of all senders also demonstrated that theta power decreased more from baseline to the trial than did beta. This suggests that, relative to theta, beta frequencies increased; the latter are common when an individual is involved in mental activity (Andreassi 1995: 23), so this result may reflect senders' interest and thoughts regarding the video clips.

Analysis of all receivers demonstrated a decrease in power across all bands from baseline to the trial, with delta decreasing more than theta. As with the sender EEG, an unexpected change across all bands may be an artefact. With receivers, the baseline recording involved leaving participants alone in darkness, with their eyes closed, for five minutes. It is plausible that receivers did not remain as still and relaxed as desired in this unusual environment (indeed, some reported being slightly uncomfortable during this time), which may have led to increased muscle movements and thus artificially high values for the baseline period. However, following the relaxation period receivers are likely to have adjusted to the environment more fully. The hypothesis of a relative increase in power in the theta band during the trial was not supported; this finding is in line with those of Wackermann *et al*. (2002) and Pütz *et al*. (2006), who also found no evidence of ganzfeld stimulation inducing theta rhythms.

The photic stimulation of the senders appeared to have no clear effect on their theta power, which did not support the hypothesis. Post hoc tests demonstrated a slight

tendency for delta suppression in strobe trials relative to non-strobe trials, but this is a very speculative interpretation. There are several possible reasons for this lack of effect of the strobe. Firstly, the study setup attempted to show senders a video clip whilst also providing photic stimulation; it may be that, despite the high brightness level of the strobe, the additional illumination of the computer screen interfered with any potential driving effect. Secondly, photic driving is not guaranteed to occur for all participants; for example, of Glicksohn's (1986) four participants, only two demonstrated driving with flashes at 10Hz. Thirdly, it is possible that a photic driving effect would have been more easily detectable at other recording sites, such as those in the area of the occipital lobe. However, despite this apparent lack of success in photic driving of the senders, an interesting result was still found relating to the strobe; for receivers, theta power was significantly higher relative to alpha in strobe trials than in non-strobe trials. This supports the hypothesis of relatively greater theta power in strobe trials, suggesting that the photic stimulation of senders did have the desired effect of transferring a theta rhythm to the receivers. However, without evidence of photic driving in the senders it is not possible to demonstrate that such a transfer occurred; for example, although perhaps less plausible, it is possible to argue that the effect was due to clairvoyance of the strobe rather than telepathy of the sender's experience of the strobe. Nevertheless, this is a potentially encouraging significant result.

For senders, there were no differences in EEG between trials with and without direct hits, or between trials with and without binary hits. This was also the case for receivers, but there was a non-significant tendency for receivers obtaining direct hits to display an increase in power in the theta and alpha bands between periods 2 and 3

of the trial; this pattern was also noticeable for binary hits, but to a lesser degree. This is potentially of interest since it suggests that increases in power in the two key frequency bands may be related to hitting, but again this must remain a somewhat speculative interpretation. Furthermore, as mentioned earlier, given the overall null findings in terms of ESP, one would not necessarily expect to find meaningful correlates of hits.

Overall, despite some findings of interest, this study has largely failed to provide support for the hypotheses. Direct hitting was at MCE, while binary hitting was non-significantly above MCE, as in the previous study. Unlike the earlier study, there were no suggestions of ESP scoring being related to the sender-receiver relationship or sex pairing; the only aspect that has been replicated is the non-significance of these results. Despite some significant findings, the EEG results are also relatively unconvincing in terms of evidence for any 'transfer' of EEG activity from sender to receiver, or for any correspondence between EEG activity of either participant and ESP task success.

The result of most importance is the significantly above-MCE binary hitting across the two studies; this may potentially be considered as evidence for ESP, in that receivers appeared to be able to rank the target first or second more often than would be expected by chance, based on their impressions whilst in the ganzfeld environment. Previous research, such as the Maimonides dream ESP programme, has also appeared to provide evidence for ESP through significant binary hitting (Radin 1997: 71-72), and the assessment of binary hits in ganzfeld studies, in addition to direct hits, was suggested by Hyman and Honorton (1986: 358) as a useful additional measure of task

success. However, the apparent success of the ganzfeld technique in previous research has been based on significant direct hitting (e.g. Bem 1994: 25, Bem & Honorton 1994), which was not achieved in the present two studies, either individually or in combination. Therefore, whilst the significant overall binary hitting remains a finding of interest, the results of the present studies must be considered as failing to replicate those of past research, rendering the overall evidence for ESP relatively weak.

7.4.2. Strengths and Limitations

As in the previous study, this study contained a number of strengths, including the quantitative assessment of sender-receiver relationship closeness, the following of the recommendations by Hyman and Honorton (1986: 355-362) regarding ganzfeld methodology and statistical analyses, and the use of independent judging to identify notable hits and notable misses. The present study further improved on the previous study by using dynamic targets, and also improved on past research examining EEG and ESP by using a larger sample size, examining all of the main EEG frequency bands and employing an ostensibly psi-conducive paradigm.

In terms of limitations, it is possible that the various departures from typical ganzfeld methodology had an adverse effect, since these have been proposed to decrease the effectiveness of the procedure (e.g. Bem *et al*. 2001). However, the removal of the hemispheres did not appear to have an adverse effect in the earlier study, and the use of the EEG recording equipment did not have any noticeable effect on participants' mood or behaviour, or on receivers' ability to relax in the ganzfeld environment. The use of the strobe was the feature that had the largest impact on participants'

experience, but only one sender had a sufficiently adverse reaction to ask for it to be switched off, and the study contained 42 trials without the strobe that produced very similar results to the with-strobe trials. As such, there are no clear reasons why the departures from typical ganzfeld methodology should have produced the largely null results obtained.

As mentioned earlier, there were several limitations in terms of the EEG and photic driving aspects of the study. EEG equipment was only available to perform monopolar readings, whereas it would have been preferable to measure EEG at numerous sites across the scalp. In addition, given the findings of researchers such as Glicksohn (1986), who found that photic driving does not occur for all individuals, screening for participants who demonstrated photic driving would have been useful. Attempting to use the strobe alongside the illuminated computer screen may also have interfered with any potential driving effect; this may suggest that the use of a visual target stimulus is incompatible with the induction of photic driving. An alternative may be to use auditory targets; however, two ganzfeld studies using musical targets have not been successful (Willin 1996a, 1996b), and it has been argued that using non-visual targets may be considered as non-standard ganzfeld methodology (Schmeidler & Edge 1999: 349-352). Therefore, while the present study attempted to provide a novel combination of video and photic stimuli for the sender, future research may benefit from examining these stimuli separately.

Although not necessarily a limitation, the length and quality of the relaxation procedure may also be worthy of further investigation. Both studies used the same five-and-a-half minute procedure, while other studies have used longer versions, such

as eight minutes (Parker 2010: 123), fourteen minutes (Bem & Honorton 1994: 9) and twenty minutes (Da Silva, Pilato & Hiraoka 2003: 250). Although participants did not report any problems relaxing, it is possible that a longer relaxation period may have rendered them more likely to enter the drowsy theta state.

Another potentially important aspect of both studies was the lack of a requirement for continuous verbalisation by the receiver. This was intended to have benefits in terms of allowing more complete relaxation and achievement of an altered state of consciousness; in the present study, it also minimised artefacts on the EEG trace due to muscle movement. However, as discussed earlier and in Chapter 5, this allowed the possibility of receivers forgetting some impressions. This was potentially more problematic for the independent judges, who may have been ranking the targets and decoys based on incomplete information, whereas receivers' memories were often refreshed when viewing certain features of the pictures or video clips. Nevertheless, it is still possible that some receivers may have made different decisions had they been provided with a full record of their detailed mentation during the trial, and the assessment of notable hits and notable misses may also have been adversely affected if independent judges were provided with incomplete information. Pütz *et al.*'s (2005) method of asking their participants to restrict their mentation reports to discrete 'chunks' may therefore be a better alternative in terms of providing a satisfactory balance between relaxation and verbalisation.

Some other aspects may also have limited both studies' ability to fully identify whether ESP task success depended on the sender-receiver relationship and sex pairing. For example, as expected, there was a confound between these two variables,

in that romantic pairings were largely mixed-sex; only one same-sex romantic pairing was able to be tested across the two studies. Small numbers of some pairings, particularly all-male pairs and siblings, may also have been a hindrance for the analyses examining differences between groups, and so a more balanced composition of pairings would have been desirable. However, the inclusion of the QECR measure was intended to reduce the importance placed on categorising participants, and was a very useful addition to the studies; for example, while one may assume that siblings who attend a study together will be closely bonded, QECR scores suggested that this was not necessarily the case, while other pairings demonstrated a mismatch in the strengths of bond of each member of the pairing to the other. However, it is likely that pairs of participants who communicate sufficiently to attend a study together will have a reasonably good relationship, meaning that the full range of scores on the QECR is unlikely to be available, although the range of scores in these studies (43.08 to 96.30) suggests that the measure still allowed a good level of discrimination between very close and more lukewarm relationships. The use of the QECR, though, does not necessarily make the analysis of relationship categories obsolete, since analysis of categories can more effectively demonstrate whether there are any links between biological relatedness and ESP task success.

7.4.3. Future Research Directions

Although the results from the two reported ganzfeld studies do not provide particularly strong evidence for ESP, they do not, by themselves, indicate that continued psi research is futile. As suggested by Wiseman (2009: 21), the evaluation of whether or not psi exists must depend on a larger database of good-quality studies,

of which the present research will be an important part. There is therefore clearly a need for additional research, in order to create such a database and allow a thorough examination of whether any replicable psi effects can be detected.

In addition to the relatively weak results from these studies, the literature that has been extensively reviewed in this thesis has demonstrated considerable inconsistency in ESP research findings, raising the important question of whether it is prudent to continue with these methods. However, much of the inconsistency may have been due to the use of a variety of different methodologies by different researchers. Wiseman (2009: 21) criticises parapsychologists for continually attempting to create new paradigms, and argues that researchers should instead use one or two procedures that have already been identified as yielding the most promising results; indeed, the ganzfeld procedure was used in the present studies for this reason, given that several series of well-controlled ganzfeld studies with good sample sizes have produced significant results (e.g. Bem & Honorton 1994, Dalton 1997, Parker 2000), and parapsychologists have frequently cited it as producing replicable effects (e.g. Roe 2009: 24). The ganzfeld technique would therefore appear to be the most promising paradigm in terms of its potential to demonstrate replicable evidence of ESP to the satisfaction of non-parapsychologists, and it is recommended that it continues to be used in future research. Furthermore, given the suggestion that deviations from the standard methodology decrease the effectiveness of the procedure (e.g. Bem *et al*. 2001), it is also recommended that future research follows this standard procedure as closely as possible. The present studies did include some departures from the typical methodology, such as the non-use of hemispheres and the lack of continuous verbalisation during the trial; while it is not clear specifically how these changes may

have had an adverse effect, it is possible that these may explain the obtaining of only significant binary hitting rather than significant direct hitting in these studies. While there is scope for further examination of eyes-closed ganzfeld stimulation, in terms of its potential tendency to induce theta rhythms and true hypnagogic imagery, it may therefore be preferable for future research to retain the use of the hemispheres and continue to ask receivers to verbalise their impressions, either continually or in 'chunks' as suggested by Pütz *et al*. (2005).

The results from the present studies suggest that the sender-receiver relationship and sex pairing do not have any clear relation to ESP task success. As mentioned earlier, it may therefore be prudent for future research to focus on other aspects that have been suggested to be important, such as belief in the paranormal (e.g. Lawrence 1993), extraversion (e.g. Parra & Villanueva 2003) and creativity (e.g. Dalton 1997, Schlitz & Honorton 1992). However, if researchers do wish to continue examining the sender-receiver relationship and sex pairing in conjunction with these other variables, the use of a relationship closeness measure such as the QECR is highly recommended; it is also advisable to attempt to obtain a sufficient number of same-sex and mixed-sex romantic pairings, to allow a clearer examination of whether the closeness or sexes of pairings are more important in determining task success.

In addition to the examination of correlates of ESP task success, it is also recommended that researchers identify and re-test pairings or individual participants who perform well, in order to attempt to obtain consistently successful participants; the use of independent judging, in order to identify notable hits, is likely to be beneficial in this respect. This may allow a greater likelihood of producing a

replicable demonstration of ESP, and will also permit a further examination of whether such participants display common traits that will allow identification of other potentially successful individuals.

Given the inconsistency identified in the review of the literature in Chapter 6, and the largely non-significant results of the present study, the examination of EEG in ESP research has provided less convincing evidence for psi than the examination of conscious responses in the ganzfeld; it may therefore be preferable for researchers to focus on the latter if they wish to satisfy Wiseman's (2009: 21) requirements in terms of using procedures that have obtained the most promising results. Nevertheless, the present study did obtain a significant result that was suggestive of receivers demonstrating relatively greater theta power when senders were viewing the strobe. The possibility of 'transferring' photic driving from senders to receivers may therefore be worth continuing to research, in an attempt to identify whether this is possible or whether such transfer is limited to short trains of stimuli. As in the present study, it is recommended that researchers use sufficiently large sample sizes, employ ostensibly psi-conducive methodology and assess all of the main EEG frequency bands; however, clearly the measurement of a larger number of EEG sites will be beneficial to examine which are the most promising in terms of demonstrating photic driving and transferred potentials. Despite the relatively weak evidence for ESP obtained in these studies, there is therefore much this research has to offer in terms of suggestions for future directions.

Chapter 8

Summary and Conclusions

8.1. Summary

The stated overall aim of this thesis was to combine spontaneous case research with laboratory research, using the former to provide suggestions for the latter, in an attempt to examine whether, together, they point to the operation of parapsychological or purely psychological processes in the occurrence of ostensibly extrasensory experiences. Despite obtaining significant binary hitting across the two laboratory studies, this research as a whole does not offer convincing evidence for the existence of an anomalous process. The reasons for this apparently contradictory interpretation are due to a key strength of the overall thesis, namely its coverage of multiple interlinking aspects of parapsychological research. Independently, a significant result would be viewed as a promising finding; however, in the context of the literature that has been extensively reviewed, and in the context of the overall findings of the thesis, this single result does not appear to satisfactorily demonstrate the existence of psi.

The research on spontaneous cases discussed in Chapter 2 identified a number of recurring features of cases identified by Rhine and Schouten, such as the predominance of female percipients, the closeness of relationship between percipients and target persons, and the seriousness of the events to which the experiences ostensibly related. However, one of the key contributions of Rhine (1953a: 109, 1978: 23) was to identify the main forms of experience, namely intuitions, hallucinations and dreams (realistic and unrealistic), and draw attention to the fact that they are all

familiar psychological phenomena. This followed Tyrrell's (1946: 72) earlier proposition of a two-stage process, suggesting that while the acquisition of information is paranormal, the experiential aspect occurs through conventional psychological mechanisms. On this premise, Rhine (1953a, 1956, 1978) and Schouten (1983) engaged in extensive theorisation as to the processes involved in the second stage; however, the validity of such theorisation depends on their cases being genuine instances of ESP, which cannot be guaranteed. A sceptical view may be that, given the apparent involvement of purely psychological mechanisms in these experiences, there is no need to invoke an anomalous cause. However, the theorisation of Rhine, Schouten, and others (e.g. Irwin 1979 cited in Edge *et al*. 1986: 192, Roll 1966, 1987, Stanford 1974, 1990, 2006, Stevens 2002) does appear at least somewhat plausible, and many compelling cases of ostensible ESP have been published (e.g. Rhine 1953a).

The review of research in Chapter 2 identified a lack of studies examining the aftermath of ESP experiences, including the participants' rationalisation of their experiences as paranormal; the case collection study reported in Chapter 3 therefore aimed to examine this aspect of these experiences in more detail, taking a more critical approach than that employed in past research by attempting to consider the various non-paranormal mechanisms that may have been operating. Similarly to the relatively relaxed approach of Rhine (1951: 165-166), cases were included as long as they fitted the definition of an ESP-like experience; given that hoax cases are rare (Schouten 1979: 451, West 1948b: 274-277) and non-authenticated cases appear to be little different from those that have undergone extensive corroboration (Schouten 1979: 448), the validity of the cases was expected to be satisfactory. The features of

the collected cases were largely similar to those of the case collections analysed by Schouten (1979, 1981, 1982), as were the results of many of the analyses examining differences and associations between the various characteristics of the cases. There were some discrepancies, most notably the slight predominance of female target persons, but none that were especially large departures from the earlier patterns. The similarity between contemporary cases and those from Victorian Britain, and from Germany and the USA in the early-to-mid twentieth century, is striking, but is not in itself evidence of any anomalous process. More illuminating were participants' responses regarding the normal explanations they had considered for their experiences, and their reasons for rejecting them. Approximately one-third of participants either had not considered a normal explanation, or could not think of one, and similarly the most common reason given for a paranormal interpretation was that no normal explanation was sufficient. Given that even the most compelling of experiences could potentially be interpreted as having a non-paranormal cause such as coincidence, and there was therefore presumably at least one conceivable normal explanation for all of the reported experiences irrespective of whether they may or may not have involved ESP, this demonstrates that many experients may not be satisfactorily critical of their experiences, and may therefore prematurely reach the conclusion that their experience has an anomalous cause. The more in-depth questioning occasionally produced additional information that rendered a previously compelling experience less so, providing evidence in support of West's (1948b: 279) suggestion that participants may give more detail on points favouring their paranormal interpretation, while intentionally or unintentionally omitting details that do not fit with this explanation.

Overall, despite the presence of a small number of relatively compelling accounts, the reported study of spontaneous cases did not produce a sufficient number of high quality cases for the psi hypothesis to be seriously entertained. This situation is similar to that of West (1948b: 290), who was generally critical of the quality of the cases collected by the SPR, arguing that for every good case there were approximately a hundred that could be explained by normal means; he also considered that even the best cases may be simply due to "an unusual extension of the normal factors" that form more plausible explanations for the weaker cases (West 1948b: 299). Based on the case collection reported in Chapter 3, West's argument appears sound.

Although evidentially weak, the study of spontaneous cases fulfilled J. B. Rhine's (1948b: 232) vision of providing suggestions for experiments, due to the clear tendency for the percipient and target person to share a close bond, either emotionally or biologically; Chapter 4 therefore presented a detailed review of laboratory research examining this aspect. Although approximately half of the reviewed studies demonstrate apparent evidence in favour of a closer bond being conducive to ESP, the studies vary widely in quality and in methodology, comparing a number of different categories and qualities of relationship. It is apparent that these studies have rarely attempted to quantitatively assess sender-receiver closeness, and largely do not appear to have taken account of results from spontaneous cases (Schouten 1983: 332) that suggest the bond of the receiver to the sender may be more important than the bond of the sender to the receiver. This chapter also identified a tendency for studies with senders to produce higher scoring than those without, and noted some recent findings appearing to suggest an advantage for mixed-sex pairings (Dalton 1994, Hume 2003), although again it was observed that the literature is marked by inconsistency.

The first laboratory study, reported in Chapter 5, was therefore conducted in order to examine the effect of the sender-receiver relationship and sex pairing upon ganzfeld ESP task success, including a quantitative assessment of the closeness of each participant's relationship with their experimental partner, and a more careful examination of the relative performance of the four sex pairing combinations. Although the key analyses were all non-significant, many of the results were in the hypothesised directions. Direct hitting was at a level similar to that of the successful PRL studies (Bem & Honorton 1994), binary hitting was close to significance, and there appeared to be a slight advantage for more closely bonded pairings. It was also demonstrated that the use of independent judging could allow the identification of 'notable hits', where participants and all judges rank the correct target in first position, and 'notable misses', where participants and all judges rank the same decoy in first position. It was argued that, since there may be a temptation for researchers to present notable hits as if presenting evidence of ESP, the examination of notable misses can act as a balancing measure, reminding researchers of the possibility of very close correspondences occurring by chance. However, it was also argued that the ratio of notable hits to notable misses could potentially act as an additional measure of the likelihood of ESP having occurred in at least some of the hitting trials, and that notable hits could be examined in more detail to determine whether there are any correlates of these hits that may be indicative of variables that are related to ESP ability.

Chapter 6 then presented a review of ESP research using brain activity measurement, including EEG, ERPs and fMRI. It is clear that, despite the stated intention of the ganzfeld environment to create a hypnagogic state (Bertini *et al*. 1964: 496), and its

relative success in terms of providing evidence for ESP (Palmer 2003), much research has focussed on the alpha EEG frequencies associated with relaxation rather than the theta frequencies associated with drowsiness, and results are mixed (Palmer 1978: 127, Palmer 1982: 56-57). The research team of McDonough, Don and Warren (e.g. McDonough *et al*. 1994) have conducted several studies examining various brain areas and frequency bands but, again, findings have been relatively inconsistent. Whereas these studies examined EEG correlates of hitting based on conscious responses from participants, studies of 'unconscious psi' using ERPs and fMRI may potentially provide more compelling evidence of an anomalous process, due to the apparent increase in objectivity from removing the requirement for participant 'guesswork' to determine task success. Again, despite some seemingly promising findings (e.g. Kittenis *et al*. 2004), there are various inconsistencies in these studies in terms of whether significant results are found and, if they are, which specific brain areas are implicated. It is telling that one of the most prominent researchers in this area, Wackermann (2008: 152), considered there to be "no signs of real progress". There are further problems for the psi hypothesis given that there is still no agreed theory on how it may function; the most recent theorisation makes use of concepts from quantum theory (e.g. Radin 2006), but this has been met with scepticism from the wider scientific community (e.g. Smith 2010: 77).

Although ESP research using brain activity measurement has produced largely inconsistent results, it is also apparent that many of the studies have suffered from issues such as small sample sizes, assessment of only a single EEG frequency band, and the lack of use of an ostensibly psi-conducive experimental paradigm; this suggests that improvement of these problems may potentially lead to stronger and

more replicable results. The second laboratory study, reported in Chapter 7, therefore attempted to combine a number of aspects, including the ganzfeld environment, EEG recording of both participants, and photic driving of the sender, in addition to a continued examination of the sender-receiver relationship and sex pairing. Due to the use of a larger sample size than the first study, and the use of dynamic rather than static targets, it was anticipated that the results from the first study, namely above-MCE direct and binary hitting and higher scoring for more closely bonded pairings, would reach significance. However, in contrast to the seemingly promising results of the first study, direct hitting was exactly at MCE, binary hitting was non-significantly above MCE, there was no evidence of greater success for more closely bonded pairings, and there were no conclusive results relating to EEG or photic driving. There was only one notable hit, in comparison to ten notable misses. However, despite being non-significantly above MCE in both studies, binary hitting was significantly above MCE when the results from the two studies were combined. As stated earlier, had this finding been obtained in isolation, one may claim to have provided evidence for the occurrence of ESP. However, the results of the two laboratory studies reported in this thesis demonstrate the same issues with inconsistency as do the reviews of the literature in Chapters 4 and 6, and the databases of ganzfeld research discussed in Chapter 1. In many cases initially 'promising' findings have not been replicated, or replication has been erroneously claimed due to the finding of an anomalous effect, even if this effect is different to that found previously (Hyman 2009: 27). In the case of the two studies in this thesis, binary hitting was marginally non-significant in the first study, and non-significant in the second, so it would be remiss to claim that replication had occurred, other than in the form of a non-significant effect. Even if one were to claim that the overall significant binary hitting demonstrated that ESP had

occurred across these two studies, this result does not replicate the significant direct hitting of previous ganzfeld studies such as those in the PRL database (Bem & Honorton 1994). Although still potentially an intriguing and anomalous finding, this therefore does not satisfactorily demonstrate the existence of psi.

8.2. Contributions of the Research

This thesis has made a number of important contributions to the fields of parapsychology and anomalistic psychology. Firstly, the study in Chapter 3 demonstrated the value of a thorough and critical examination of spontaneous cases of ostensible ESP. While this study followed the research of Milton (1992) by examining the aftermath of the experiences, it did so with a considerably larger sample of cases of apparent ESP (94 in comparison to 7), and included a key question that was not asked by Milton, regarding the non-paranormal explanations that had been considered for the experience. This question, along with others such as why a paranormal explanation had been favoured, provided some revealing responses that illustrated a tendency for some experients to be insufficiently critical about their experience; furthermore, some experiences that appeared relatively compelling from their initial description became less so following the responses to more in-depth questions. The largely poor evidential quality of the cases is in line with the findings of West (1948b: 299), and must raise important questions as to the value of the theorisation of researchers such as Rhine (1953a, 1956, 1978) and Schouten (1983), who have based their ideas on patterns observed in spontaneous cases. More generally, this raises questions as to whether spontaneous cases really do suggest the existence of an anomalous process that is worthy of study in the laboratory, or whether a thorough

examination of even the most outwardly compelling cases will reveal strong suggestions that ordinary psychological processes are responsible. The highlighting of this issue, namely the need for parapsychologists to ask more demanding questions of the experiences that form the foundations of the field, is an important contribution of this research.

This thesis has also reported 140 trials of ganzfeld ESP testing, in two studies that were methodologically sound and used a procedure that has already been identified as yielding promising results, in line with Wiseman's (2009: 21) suggestions. This was particularly important for the study using EEG recording, which improved greatly upon much previous research by using a large sample size, examining all of the main EEG frequency bands, and using an ostensibly psi-conducive procedure. The two studies, with 60 and 80 trials respectively, are among the largest individual studies in the entire database of ganzfeld research (see Bem & Honorton 1994: 11, Bem *et al*. 2001: 210-211, Hyman 1985: 13, Storm & Ertel 2001: 428, Storm *et al*. 2010: 483), and were well-controlled, following the recommendations of Hyman and Honorton (1986: 355-362). These studies will therefore form an important part of the overall database of ganzfeld ESP research.

The ganzfeld studies also included several features that are recommended for use by other researchers. For example, the use of a quantitative measure of sender-receiver relationship strength is a valuable improvement to the examination of relationship categories, since it does not rely on assumptions that particular categories will contain particular levels of relationship strength, and it allows separate analyses of sender-to-receiver and receiver-to-sender closeness, rather than assuming that these will be

similar. It is also clear from these studies that research that examines the sender-receiver sex pairing should routinely assess the sender-receiver relationship, in order to more clearly identify whether any effects are due to either or both of these variables.

The recommendation for the use of independent judges, to allow identification of notable hits and notable misses, is another key contribution of this research, since this permits a more objective identification of such hits and misses than relying solely on the researcher's interpretation. Given that a direct hit-rate of 25% is expected as MCE, even a clearly above-MCE hit-rate of 35-40% would indicate that a majority of hits were likely obtained by chance. Although ESP cannot be definitively determined to have occurred in any individual trial, it may be tentatively suggested that trials that produce notable hits are more likely to have involved ESP than other hitting trials, and should therefore be examined in more detail; examining the correlates of these notable hits may also be more informative than examining correlates of all hits, due to the latter's likely high proportion of non-ESP hits. However, it is also important to consider notable misses in order to provide some balance to this analysis, preventing researchers from providing a biased impression of the overall success of a study by presenting only notable hits.

8.3. Limitations

Although this thesis has made a number of important contributions, it also contains some limitations. The spontaneous cases were not authenticated, so it is possible that the reports may have contained inaccuracies or fabrications. However, this was also

true for the collections of Rhine and Sannwald; furthermore, Schouten (1979: 451) demonstrated that there was little difference between authenticated and non-authenticated cases, and West (1948b: 274-277) argued that relatively few accounts appear to be pure lies, so it would seem unlikely that this lack of authentication had any serious effects on the results. The fact that participants were not required to believe that their experience was of a paranormal or extrasensory origin may have permitted the inclusion of some low-quality cases and led to inconsistency in the attitudes of the participants towards their experiences, but this only seemed to apply to a small number of participants. A potentially more important issue was the relatively low number of non-student responses, meaning that the sample was not representative of the general population; however, analyses suggested that the student respondents did not have a large effect on the overall results, and the sample was more likely to contain participants who were not familiar with parapsychological research, compared to Milton's (1992) sample of participants who were largely from the SPR and Scottish SPR.

For the laboratory studies, the numbers of participants in some sender-receiver relationship and sex pairing categories were low, particularly siblings and all-male pairings; larger numbers of these pairings would have been desirable to give more balanced group sizes and potentially more representative results. However, the use of the QECR meant that an alternative, more sensitive measure was available for analyses of the sender-receiver relationship. As in the study of spontaneous cases, the sample was not representative of the general population, being composed of university students and staff and their friends and family members; there is no clear reason why this may have adversely affected scoring, but a more representative

sample may have been beneficial to avoid the possibility of unintentionally sampling from a non-psi-conducive population. 'Unselected' participants were used due to their ease of recruitment, their advantage of allowing more effective testing of correlates of ESP task success, and because they have been demonstrated to achieve significantly above-MCE scoring (e.g. Bem & Honorton 1994: 11); however, it may have been beneficial to attempt to recruit participants from a population that has been found to obtain particularly high scoring, such as artistic or creative individuals (e.g. Bem & Honorton 1994: 11, Dalton 1997, Schlitz & Honorton 1992).

Another potential issue was the requirement for receivers to remember their impressions from the ganzfeld environment and report them following the trial, rather than continually verbalising them; this was intended to allow receivers to fully relax and achieve the required altered state of consciousness, as well as to minimise artefacts on the EEG trace due to muscle movement in the second study, but it also allowed the possibility of forgetting of impressions. This was not especially problematic for the receivers, since they were able to have their memories refreshed when viewing certain features of the targets and decoys; however, in these instances the independent judges were required to rank the targets and decoys based on incomplete information, which may have affected the assessment of notable hits and notable misses. It is also possible that some receivers may have made different decisions if they had been provided with a full record of their mentation during the trial. The use of a technique such as asking participants to restrict their mentation reports to discrete 'chunks' (Putz *et al*. 2005: 8) may therefore have been a better alternative, in terms of providing a satisfactory balance between verbalisation and relaxation.

There were also some issues in terms of the EEG and photic driving aspects of the second laboratory study. It would have been preferable to measure EEG at numerous sites across the scalp, rather than using monopolar readings, and to screen for participants who showed photic driving. While the study attempted to introduce a novel combination of video and photic stimuli for the sender, it is possible that the illumination of the computer screen interfered with any potential driving effect. In general, the inclusion of EEG measurement and photic driving, and the non-use of the translucent hemispheres, meant that the study deviated somewhat from standard ganzfeld methodology. Such deviations have been suggested to decrease the effectiveness of the procedure (e.g. Bem *et al*. 2001); however, results from the first study demonstrated no adverse effects of removal of the hemispheres, the use of the EEG equipment did not have any noticeable effects on participants' mood, behaviour or ability to relax, and analyses demonstrated that trials using the strobe produced very similar results to trials that did not use it. There are therefore no clear reasons why the deviations from typical ganzfeld methodology may have had any adverse effects, but given the findings of researchers such as Bem *et al*. (2001), it may have been advantageous to adhere to the standard procedure as closely as possible, rather than attempting to introduce novel features.

8.4. Future Research Directions

Wiseman (2009: 21) argued that the final assessment of psi would depend on the creation of a database of well-controlled studies; although the two studies reported here will make an important contribution to the field, they cannot constitute such a database by themselves, so the evaluation of the existence of psi requires additional

studies to be conducted by other researchers. One potential issue in creating this database is that, in contrast to critics of the field such as Hyman (2009) and Wiseman (2009), many parapsychologists consider that psi has already been satisfactorily demonstrated (e.g. Radin 1997: 91), and may not appreciate Wiseman's ultimatum. It may therefore be the case that new researchers, such as the present author, will be obliged to conduct the required studies; this will in fact be an advantage, as it will allow the opportunity to fully demonstrate whether or not any effects are replicable across different researchers and research laboratories, rather than relying on researchers who have already conducted numerous studies and who therefore cannot strictly produce independent replications.

While the contributions of new researchers will be welcomed, it would still be advisable for established psi researchers to attempt to contribute to this database. In practical terms, these researchers have experience in conducting psi studies and are already likely to have laboratory setups in place, rendering data collection potentially more rapid. More importantly, it is clear that, while parapsychologists may consider that there is sufficient evidence for the existence of psi, mainstream scientists do not agree. The present researcher, having been persuaded of the reality of ESP at the outset of this project due to prominent positive results such as those from the PRL ganzfeld studies (Bem & Honorton 1994), is now also of the view that, based on the thorough reviews of the literature presented in this thesis, the results do not display an adequate level of replicability to claim that there is sufficient evidence for the existence of an anomalous process. There would seem to be little purpose in parapsychologists continuing to operate without the acceptance of mainstream science, since any additional research findings or theories will continue to be largely

ignored, no matter how potentially valuable they may be to an enhanced understanding of the universe. Therefore, while established psi researchers may question the value of conducting studies to demonstrate the existence of a phenomenon that they already consider to exist, this will be a relatively minor inconvenience compared to the potential for all subsequent parapsychological research to be disregarded.

Given the generally positive view of ganzfeld research by parapsychologists in terms of its demonstration of a replicable effect (e.g. Roe 2009: 24), this paradigm would seem to be the most prudent to employ in conducting further studies to include in the database. Since the publication of Wiseman's (2009) appeal, there have been a small number of published ganzfeld studies, including Parker's (2010) study of MZ twins, discussed in Chapter 4, and a study by Marcusson-Clavertz and Cardeña (2011); these studies obtained non-significant direct hit-rates of 36% and 27% respectively. Although deviating from the standard ganzfeld procedure, Roe *et al*. (2010) conducted a precognitive remote viewing study, comparing participants' performance in ganzfeld conditions and in an ordinary waking state; they found significantly above-MCE scoring in the ganzfeld condition (35% direct hit-rate) and non-significantly above-MCE scoring in the waking state (30% direct hit-rate). Although scoring has been consistently above MCE in these studies, it has not always been to a significant degree; one of the studies in this thesis also produced a non-significantly above-MCE direct hit-rate, while the other produced direct hitting that was at MCE. Based on this small group of studies, there appears to be a familiar pattern of results that are potentially promising but ultimately inconsistent; however, a larger database must be

developed before there can be a proper evaluation of the evidence for ESP from this research.

Given that deviations from standard methodology may decrease the effectiveness of the ganzfeld procedure (Bem *et al*. 2001), it is advised that researchers attempt to replicate the methodology of standard, successful studies such as those from the PRL (Bem & Honorton 1994). While there is potential to continue the examination of eyes-closed ganzfeld stimulation and reduced verbalisation, in an attempt to induce theta rhythms and true hypnagogic imagery, it may be preferable to include the use of hemispheres and continuous verbalisation, as in the PRL studies. However, it is advised that researchers follow the present studies by using independent judges in order to identify notable hits and misses, since this will act as an additional feature rather than a change to the basic methodology.

In terms of participant selection, from past research and the present studies it would appear that the sender-receiver relationship and sex pairing are not consistently related to ESP task success. Future research may therefore benefit from obtaining participants based on other features that have been suggested to be related to ESP ability, such as belief in the paranormal (e.g. Lawrence 1993), extraversion (e.g. Parra & Villanueva 2003) and creativity (e.g. Bem & Honorton 1994: 11, Dalton 1997, Schlitz & Honorton 1992). However, if researchers wish to examine whether the sender-receiver relationship is important when considered alongside these other variables, it is recommended that a quantitative measure of relationship closeness is used, such as the QECR. While this thesis combined spontaneous cases and laboratory research by using the former to provide suggestions for the latter, there is also potential for

combining these in terms of identifying particularly compelling spontaneous cases and recruiting the respondents to take part in laboratory studies; this was not possible in the present research due to the anonymous nature of the questionnaire, but some previous studies have selected participants on the basis of their experiences of ostensible ESP (e.g. Parker 2010).

Selecting participants based on these variables may potentially lead to higher scoring across the whole sample, but it may also be beneficial to attempt to identify consistently high-scoring individuals or pairings, as in J. B. Rhine's (1934/1964) original forced-choice testing programme; the analysis of notable hits may be of use here in identifying participants who are worthy of inviting for further testing. Such repeated testing of individuals is relatively rare in contemporary parapsychological research, partly due to the desire to identify correlates of task success, but also due to the potential for cheating (Irwin & Watt 2007: 63, Milton & Wiseman 1997: 29-31). However, since the aim of this database is simply to demonstrate the existence of psi, and given that parapsychologists now have sufficient knowledge of methodological rigour to eliminate the possibility of fraud, the attempted identification of high-scoring participants may be a worthwhile endeavour.

The examination of brain activity in ESP research has provided less convincing evidence for psi than the examination of conscious responses in the ganzfeld. However, if researchers wish to continue research in this area, the possibility of transferring photic driving from senders to receivers may be worth continued investigation, based on the result in the second study in this thesis that identified relatively greater theta power in receivers when senders were viewing the strobe. It is

recommended that such studies follow the example of the present research by using sufficiently large sample sizes, employing ostensibly psi-conducive methodology and assessing all of the main EEG frequency bands; it is also advised that researchers improve on the present research by assessing EEG at a number of sites across the scalp, and by ensuring that photic stimulation is not accompanied by another illuminated visual stimulus.

While Wiseman (2009: 21) provides a sound suggestion in terms of using procedures that have already been identified as yielding the most promising results, his argument that parapsychologists should stop attempting to develop new procedures (Wiseman 2009: 21) is less robust. Although it appears that deviations from the standard ganzfeld procedure may adversely affect the results (Bem *et al*. 2001), and that research using modern techniques to examine brain activity has largely been unsuccessful in demonstrating any replicable effects, there remains the potential for discovering more psi-conducive experimental paradigms. One possibility is to attempt to recruit and consult individuals who claim to have particularly strong psychic ability; not only will this allow testing of their claims, thereby satisfying the earlier suggestion of obtaining participants who have had spontaneous experiences of ostensible ESP, but it may also enable procedures to be altered or newly created based on the advice of individuals who may have deeper insight into the conditions that appear to be psi-conducive.

Roe (2009: 25) makes the valid point that critics should set out what levels of replication they would accept as being appropriate for parapsychological research. If replication can be achieved with a new database of well-controlled studies, then

parapsychologists will be vindicated in their interpretation of psi as a real phenomenon, and in their continued research and theorisation. However, even if psi cannot be satisfactorily demonstrated, there remains a vast array of potential research avenues examining purely psychological aspects of ostensible psi experiences and other paranormal phenomena. For example, there is potential to conduct additional research on spontaneous cases of ESP, building on the findings reported in Chapter 3; if psi does not exist, it must be asked why participants continue to report ostensibly extrasensory experiences. An in-depth case study approach may be desirable, employing thorough interviews of percipients, target persons, witnesses and confidants at several time points following the experience, to allow a detailed examination of how these various individuals rationalise and make sense of the experience, how they may influence each other, and how their ideas may change over time.

Wiseman (2009: 21) states that, if replicable evidence of psi cannot be obtained, parapsychologists will need to have "the courage to accept the null hypothesis". Similarly, if parapsychologists can demonstrate that psi effects are replicable to a satisfactory level, critics of the field will need to display similar courage in accepting the reality of psi. As good scientists, neither of these groups should fear these scenarios; irrespective of the overall outcome, there is much opportunity for future research.

8.5. Conclusion

Overall, this thesis has succeeded in its aim of combining spontaneous case research with laboratory research examining ESP. From thorough reviews of the literature it is apparent that, despite some seemingly promising results, inconsistency and lack of replication are common throughout the field of parapsychology, and similar issues have become evident in the two laboratory studies reported here. The study of spontaneous cases has also suggested that, far from being compelling real-life examples of an anomalous process, the majority of accounts of ostensible ESP appear to have plausible normal explanations.

In their joint communiqué regarding the evidence for psi in ganzfeld research, Hyman and Honorton (1986: 353) stated that "the final verdict awaits the outcome of future psi ganzfeld experiments – ones conducted by a broader range of investigators and according to more stringent standards". The fact that a similar call is being made almost thirty years later suggests that the evidence for psi remains unconvincing, but the present researcher agrees with Wiseman (2009: 21) that there are a sufficient number of potentially promising findings to warrant giving psi "one last chance". However, based on the extensive reviews of the literature and the three studies conducted, the evidence from this thesis points more strongly to a psychological interpretation of ostensibly extrasensory experiences, rather than to an interpretation involving psi.

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Appendices

Appendix A - Ethical Approval Forms

Memorandum

Coventry University

Faculty of Health & Life Sciences
Coventry University Ethics Committee

To
Ben Roberts

cc
Ian Hume

From
Satwant Sandhu (Mrs)
Ethics Administrator

Email: s.sandhu@coventry.ac.uk
Tel. No: 024 7679 **5813**
Delivery Point RCG17

Our Reference
PG41/08

Date
21 May 2008

Subject: Application for Ethics Approval

Thank you for submitting your application to Coventry University Ethics Committee.

I am pleased to inform you that your application has been approved. Please find a signed copy of Form 1 and a Peer review form for your reference.

Best wishes with your research project.

COVENTRY UNIVERSITY ETHICS COMMITTEE (Form 1)

POSTGRADUATE STUDENT & STAFF APPLICATION FOR ETHICAL APPROVAL

Name: Ben Roberts **E-mail :** aa3222@coventry.ac.uk		
Designation / Subject & Faculty: Psychology, Health & Life Sciences		
Title of Study: Witnessing the unexplained: Applying the "pragmatic approach" to a contemporary case collection of ostensible extra-sensory perception experiences.		
1. Summary of proposal A self-report study collecting and examining accounts of ostensibly "extra-sensory" experiences, looking at the features of these experiences in addition to the language used in the reports.		
2. Sample of participants Coventry University students will be recruited using the University's Research Participation Scheme. All other participants will be recruited using an online survey system. It is aimed to obtain at least 300 participants, although this will depend upon the success of advertising the study outside the University.		
3. Site/s location Coventry University		
*Tick / Cross. *Where answered 'NO', please give reasons on separate page.*	**Yes**	**No***
4. Scientific background, design, method and conduct of the study. a) Have you given a justification for the research?	✓	
b) Have you commented on the appropriateness of the design, the perceived benefits, risks and inconveniences to participants?	✓	
5. Recruitment of participants. Have you provided a comprehensive account of the characteristics of the population including the process for obtaining access as well as the inclusion and exclusion criteria?	✓	
6. Care and protection of research participants and researcher. Have you given an account of any interventions, situations and risks which have the potential to cause harm to the participants and researchers?	✓	
7. Access, storage, security and protection of participants' confidentiality. Have you identified who will have access to the data and what measures have been taken to ensure confidentiality and compliance with the Data Protection Act?	✓	
8. Informed Consent. Have you given a full description of the process for requesting and obtaining informed consent?	✓	
9. Community considerations. Have you considered how this study will benefit the participants or the community from which they have been drawn?	✓	
10. Participant information Sheet and consent form. Are these attached?	✓	
11. Source of External Funding if any Fundaçao Bial of Portugal		
Signature of student / staff B.L.H. Roberts	Address: 1 Evenlode Close, Solihull, B92 8EL	Date 1/5/08
Signature of Supervisor I.R.H.	Print Name: Ian Hume Internal Address: JS242	Date 01.05.08
Signature of Chair	O ✓ Approved. O Approved with the conditions below:	Date 20/5/08
Conditions / Comments:		

Please complete in full and return to: **Research Manager, CU Ethics Committee, Richard Crossman RCG17, Coventry University.**

This form should be accompanied by the full research study proposal, or the COREC form if applicable. Further help & information can be found on W / HLS / Student / Ethics or call Rhoda Morgan on 024 7679 5985, or e-mail r.morgan@coventry.ac.uk.

W / HLS / Student / Ethics / CU Ethics Forms / CU Ethics PG and Staff Form 1
October 2005

Memorandum

Coventry University

Academic Registry

Registry Research Unit
University Applied Research Committee

To
Ben Roberts/Helen Prudhoe

cc
Ian Hulme

From Denise McLardy

Email:

Tel. No: 024 7688 8217

Delivery Point JA109

Our Reference
Ethics-approval/2008-09

Date

February 2009

Subject: **Application for Ethics Approval**

Dear Ben/Helen,

Thank you for submitting your application to the Coventry University Applied Research Committee.

I am pleased to inform you that your application has been approved.

Best wishes with your research project.

COVENTRY UNIVERSITY ETHICS COMMITTEE (Form 1)

POSTGRADUATE STUDENT & STAFF APPLICATION FOR ETHICAL APPROVAL

Name: Ben Roberts & Helen Prudhoe **Email:** aa3222@coventry.ac.uk, prudhoeh@coventry.ac.uk

Designation / Subject & Faculty: Psychology, Health & Life Sciences

Title of Study: Detecting conscious and unconscious psi and measuring state and trait awareness in support for the ESP predictor model: A Ganzfeld ESP study with EEG recording.

1. Summary of proposal A laboratory extra-sensory perception study using EEG recording, examining the effects of sender/receiver relationship, photic driving and mental imagery capacities upon ESP task success.

2. Sample of participants
Coventry University students will be recruited using the University's Research Participation Scheme. All other participants will be recruited using advertisements in local media. Planned sample size is 60 (30 pairs).

3. Site/s location
Coventry University

*Tick / Cross. *Where answered 'NO', please give reasons on separate page.*	Yes	No*
4. Scientific background, design, method and conduct of the study. a) Have you given a justification for the research?	✓	
b) Have you commented on the appropriateness of the design, the perceived benefits, risks and inconveniences to participants?	✓	
5. Recruitment of participants. Have you provided a comprehensive account of the characteristics of the population including the process for obtaining access as well as the inclusion and exclusion criteria?	✓	
6. Care and protection of research participants and researcher. Have you given an account of any interventions, situations and risks which have the potential to cause harm to the participants and researchers?	✓	
7. Access, storage, security and protection of participants' confidentiality. Have you identified who will have access to the data and what measures have been taken to ensure confidentiality and compliance with the Data Protection Act?	✓	
8. Informed Consent. Have you given a full description of the process for requesting and obtaining informed consent?	✓	
9. Community considerations. Have you considered how this study will benefit the participants or the community from which they have been drawn?	✓	
10. Participant information Sheet and consent form. Are these attached?	✓	

11. Source of External Funding if any
Fundaçao Bial of Portugal

Signature of student / staff B. L. H. Roberts	Address: 1 Evenlode Close, Solihull, B92 8EL	Date 24/10/08
Signature of Supervisor I. K. H.	Print Name: Ian Hume Internal Address: JS242	Date 24.10.08
Signature of Chair	✓ Approved. O Approved with the conditions below:	Date 10/12/08
Conditions / Comments:		

Please complete in full and return to: **Research Manager, CU Ethics Committee, Richard Crossman RCG17, Coventry University.**

This form should be accompanied by the full research study proposal, or the COREC form if applicable. Further help & information can be found on W / HLS / Student / Ethics or call Rhoda Morgan on 024 7679 5985, or e-mail r.morgan@coventry.ac.uk.

W / HLS / Student / Ethics / CU Ethics Forms / CU Ethics PG and Staff Form 1
October 2005

Appendix B - Press Release

22nd April 2008

PRESS RELEASE

FOR IMMEDIATE RELEASE

Contact: Ben Roberts
Phone: 07834 811977
Email: aa3222@coventry.ac.uk

PARANORMAL EXPERIENCES WANTED

University Seeks Accounts of the Unexplained

Researchers at Coventry University are looking for people who believe they may have experienced Extra-Sensory Perception, or ESP, to provide a detailed account of their experience.
Psychologist Ben Roberts, who is running the project, said, “ESP refers to the obtaining of information about an external situation, without using any of the recognised human senses. This includes cases of apparent telepathy, where a person seems to know the thoughts or feelings of another person, as well as precognition, where a person seems to predict the future”.
He added, “surveys have shown that a substantial proportion of people report having these experiences, and we would very much like to build up a collection of detailed first-hand accounts. We also welcome accounts from people who are not necessarily sure whether their experience was definitely of a paranormal or extra-sensory origin, but just found it to be intriguing or unusual.”

Anyone interested in providing an account can access the questionnaire online at [URL goes here, unknown at present] or contact Ben Roberts at the Psychology Department, Coventry University, Priory Street, Coventry, CV1 5FB.

*****

For further details, or to arrange an interview, please contact Ben Roberts (details given above).

Appendix C - Advertisement for Student Participants

Study Type: Online External Study

Study Name: Extra-Sensory Perception experiences questionnaire

Brief Abstract: Questionnaire regarding experiences that seemed to involve extra-sensory awareness of information, including telepathy, clairvoyance, precognition and retrocognition.

Detailed Description:
Extrasensory perception (ESP), or paranormal cognition, may be defined as "acquisition of information about an external event, object or influence (mental or physical; past, present or future) otherwise than through any of the known sensory channels" (Thalbourne, 1982: 27).

More simply, ESP refers to the obtaining of information about an external situation, without using any of the recognised human senses. This includes the following:

- Telepathy – Knowledge of the thoughts or feelings of another person (or another animal).
- Clairvoyance – Knowledge of a current event or object.
- Precognition – Knowledge of a future event.
- Retrocognition – Knowledge of a past event.

This information may arise in a number of ways, such as:

- A dream
- Seeing a "vision" or hearing sounds, or both, while awake.
- An intuition, hunch or "gut feeling"

Have you ever had an experience that matches this description? If so, please complete this questionnaire, whether or not you believe your experience was truly extrasensory or paranormal. If you have had more than one experience, it would be most helpful if you could complete a separate questionnaire for each one. Alternatively, you may choose one or a selection of your experiences to report.

Eligibility requirements: Must have had an experience that matches the above description.

Duration: 30 minutes

Credits/Pay: 30 credits

Preparation: None

Researcher: Ben Roberts

Course Restrictions: None

Is this a web-based study? Yes – study is administered outside the system

Appendix D - Self-Report Questionnaire

Extra-Sensory Perception Experiences Questionnaire

Your Personal Details

These details will help us to see if there are any personal aspects about people that are related to the features of their experiences. You may miss out some or all of these questions if you do not wish to answer them.

1. Sex (please tick): Male □
   Female □

2. Age in completed years: _____

3. Ethnicity (please tick one, and specify where appropriate):

White – English □
White – Other British □
White – Irish □
White – Other (please specify) □
_____

Mixed – White and Black Caribbean □
Mixed – White and Black African □
Mixed – White and Asian □
Mixed – Other (please specify) □
_____

Asian – Indian □
Asian – Pakistani □
Asian – Bangladeshi □
Asian – Chinese □
Asian – Other (please specify) □
_____

Black – Caribbean □
Black – African □
Black – Other (please specify) □
_____

Arab □
Gypsy / Romany / Irish Traveller □
Other ethnic group (please specify) □
_____

4. Marital status (please tick all that apply):

Single	☐
In a relationship	☐
Engaged to be married	☐
Engaged to be in a civil partnership	☐
Married	☐
In a civil partnership	☐
Separated from a marriage	☐
Separated from a civil partnership	☐
Divorced	☐
Civil partnership dissolved	☐
Widowed	☐
Surviving partner from a civil partnership	☐
Other (please specify)	☐

_____

5. Occupation (please give some detail e.g. “manager of electrical store” rather than “manager”):

_____

6. Highest level of education completed (please state number and type of qualifications, e.g. 5 GCSEs):

_____

Your Experience

1. Please describe your experience in as much detail as you can.

Questions 2-6 ask for specific details about your experience. If you have already included these details in your description then you may miss out some or all of these questions. Please do not change your description for question 1, as it is important that it remains in your own words. Thank you.

2. Please state details regarding time, including:
    a. How long ago did the experience/event occur?
    b. What was the date or time of year?
    c. What was the time of day?
    d. How much time was there between your experience and the event to which it seemed to relate?

3. Where were you at the time of the experience, and was this indoors or outdoors?

4. What were you doing at the time of your experience?

5. If other people were involved in your experience, for example in a case of apparent telepathy:
    a. What were their sexes?
    b. What were their ages?
    c. What were their relationships to yourself?
    d. What was the physical distance between yourself and them when the experience and event occurred?

6. If there were any witnesses to your experience and/or to the event:
    a. What were their sexes?
    b. What were their ages?
    c. What were their relationships to yourself?

7. What were the effects upon your thoughts and feelings in the short term (minutes, hours and days) after the apparently extra-sensory experience (the occasion where you apparently gained the information)?

8. What were the effects upon your thoughts and feelings in the short term (minutes, hours and days) after discovering that the content of your experience matched a real-life event?

9. What were the effects upon your thoughts and feelings in the long term (up to the present)?

10. Did you tell anyone else about your experience?

    a. If so:
        i. Who did you tell?
        ii. Did you tell them before or after discovering that the content of your experience matched a real-life event?
        iii. How soon did you tell them before or after this event?
        iv. Why did you choose to tell that particular person, or those particular people?
        v. How did they react?
        vi. How did their reactions affect your thoughts and feelings?

    b. If not, why did you not tell anyone?

11. Have you considered an ordinary (i.e. non-paranormal) explanation or explanations for your experience? If so, please describe what you think these could be.

12. What has led you to the conclusion that there may be a paranormal cause behind your experience?

13. Do you know any other people who have had ESP-type experiences? If so:
    a. Please state who they are.
    b. Did they have their experience(s) before or after yours?

Thank you for completing the questionnaire. Your answers are very much appreciated.

Appendix E - Participant Information Sheet for Ganzfeld Study 1

Dean of Faculty

Dr Linda Merriman

Direct line 024 7679 5805
Direct fax 024 7679 5840
Email hsx086@coventry.ac.uk

Coventry University

Priory Street Coventry CV1 5FB

Telephone 024 7688 7688

Participant Information Sheet

You are being invited to take part in a research study. Before you do so, it is important that you understand why the research is being done and what it will involve. Please read the following information carefully, and feel free to ask the researchers any questions that you may have before you begin completing the questionnaire (contact details are given below). Please keep this Information Sheet and one copy of the signed Consent Form.

What is the purpose of the study? Studies investigating extra-sensory perception (ESP) have been carried out in a scientific manner since the 1930s, and the results of many of these studies have suggested the existence of an anomalous process of information transfer. Sceptical researchers have argued that these results are the product of inadequate methodology, statistical errors, or even experimenter fraud, but positive results have still been obtained even as experimental techniques have improved. The present study aims to add to the body of evidence already obtained, in an effort to discover whether extra-sensory perception is a reality. The study will use a traditional technique of one participant (the 'sender') viewing a picture postcard whilst the other (the 'receiver') attempts to identify the picture. The study also aims to test whether the biological or emotional relationship between the participants, and their capacity for mental imagery, are related to their ESP task success, thus exploring some of the processes of ESP.

Why have I been chosen? You have responded to an advertisement to take part in the study.

Do I have to take part? No, taking part is entirely voluntary. If you wish to take part, you will be asked to sign two copies of a consent form, one of which must be returned to the researchers. You are still free to withdraw at any time without giving a reason.

What will happen to me if I take part? You will be asked to complete the following questionnaires before the ESP task: Betts QMI, Gordon Test of Imagery Control, Dimensions of Attention Questionnaire and the Imagination Imagery Inventory (III). After the ESP trial, the receiver will be asked to complete the Dimensions of Attention Questionnaire and the III again.

For the ESP task, you will be paired with another participant of your choice, or with another person if necessary. For the first trial, you may decide who acts as the sender (the person viewing the picture) and the receiver (the person who attempts to identify

the picture that the sender is viewing). You will be taken to separate rooms, and asked to complete the QER which measures aspects of your relationship with the other participant.

The receiver will then enter an experimental situation known as the "Ganzfeld" environment. This involves being seated in a reclining chair, taping half ping-pong balls over the eyes, looking into a red light and listening to pink noise through earphones (pink noise is white noise with the harsher high frequencies removed). This setup provides you with constant, monotonous sensory input and leads to a mild altered state of sensory isolation and monotonisation. At the beginning of the trial you will be played relaxation instructions through the earphones in order to aid your entering into this altered state, and following this the pink noise will play for 30 minutes. During this second part of the trial, please relax and allow any thoughts, feelings and impressions to come to you.

During the second part of the trial, the sender will view a randomly selected picture postcard, concentrating on it in an attempt to telepathically 'send' it to the receiver.

At the end of the trial, the receiver will come out of the Ganzfeld environment – your signal for this will be the ending of the pink noise in your ears. The experimenter will ask you to describe all your thoughts, feelings and impressions that you felt during the trial, and these will be recorded onto a computer sound file. You will then be shown four picture postcards, one of which will be the picture that the sender was viewing. You will be asked to rank the pictures from 1 (most like your impressions during the trial) to 4 (least like your impressions during the trial). Following this, your recorded description will be used by an independent judge to rank the pictures in the same way. You will then be asked to complete the Dimensions of Attention of Questionnaire and the III for a second time.

You will then be given a short break, following which you will swap sender/receiver roles, and the procedure will be repeated.

What are the possible disadvantages and risks of taking part? The Ganzfeld environment may provide a rather unusual experience for the receiver. Both sender and receiver will be supervised by a researcher at all times and the session can be terminated at any point if you feel uncomfortable for any reason.

What are the possible benefits of taking part? You will gain first-hand experience of taking part in a modern ESP experiment, and may help the researchers in gaining new knowledge regarding ESP, sender-receiver relationships and imagery.

What if there is a problem? If you have a complaint relating directly to the research, please inform the researchers who will try to resolve the matter (details are given below). Failing this, you may wish to contact the Coventry University Ethics Committee chair, Professor Ian Marshall, in writing at AB122, Coventry University, Priory Street, Coventry, CV1 5FB or by telephone on 024 7688 5293.

Will my taking part in this study be kept confidential? Yes. Signed consent forms will be stored in a locked cabinet, and questionnaires will only be identified with a

Personal Identification Number (PIN), so your name cannot be linked to your answers. Your name will not be disclosed in the report of the study.

How will my data be used? The 'hit rate' (number of successful identifications of the target) over the whole study will be analysed to see if it differs from mean chance expectation and thereby suggests the existence of ESP. The number of hits will be correlated with the scores from the various self-report questionnaires, to discover more about the process behind ESP; for example, do people who experience more imagination imagery score more highly on the ESP task?

What will happen to my data after the study? Your data will be retained after the study, unless you wish to withdraw it. This is to enable the data to be re-analysed at a later date, either by ourselves or by other researchers. This is common practice in parapsychological research, for example the Journal of Parapsychology recommends retaining experimental data for at least five years.

What will happen to the results of the research study? The study results will form part of two PhD theses by the researchers. They may also be published in psychological journals, depending upon acceptance by the journals' editors.

Who is organising and funding the research? The research is being organised by Ben Roberts, Helen Prudhoe and Dr. Ian Hume of Coventry University. Fundaçao Bial of Portugal is kindly funding part of the research.

Who has reviewed the study? The study has been reviewed and approved by Coventry University Ethics Committee.

Contact for Further Information:
Ben Roberts/Helen Prudhoe
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Thank you for taking the time to read this information. Please now read and sign the consent form if you are happy to take part in the study.

Appendix F - Questionnaire for the Evaluation of Connectedness in Relationships (QECR)

Participant ID code:
(to be entered by researcher)

Questionnaire for the Evaluation of Connectedness in Relationships

This brief questionnaire requests your responses to items concerning your attitudes and convictions about various aspects of the relationship that you have with your experimental partner.

Your experimental partner is your: (please circle)

Wife Husband Partner Son Daughter Sister Brother Mother Father
Other relative Please specify: _____ Friend Acquaintance
Other: _____

How close is your relationship with this person?
Please evaluate this on a scale from 0-10 (with 10 being most closely bonded):

0 1 2 3 4 5 6 7 8 9 10

The next two pages contain a number of statements. Please evaluate each of these with respect to this relationship in so far as to whether the statements are applicable or not.

Please use the following scale to weight your responses:

1	2	3	4	5	6	☐
never applies	rarely applies	occasionally applies	often applies	usually applies	applies completely	not applicable

For example, if you are of the opinion that a particular statement often applies, then please circle the "4".

In the event that the number scale does not apply when considering a statement with respect to your relationship please mark the box "not applicable" with an "X".

Please respond as honestly as possible. Your first reaction to each question or statement is most likely your best answer. There are no "right" or "wrong" and no "good" or "bad" answers. Only your personal opinion is important.

Many thanks for your participation!

Please evaluate how accurately each of the following statements reflects your feelings with respect to the relationship you have with your experimental partner.

Use the following scale for your evaluation:

	never applies	rarely applies	occasionally applies	often applies	usually applies	applies completely	not applicable
	1	2	3	4	5	6	□
(1) In this relationship we feel in tune with each other (we frequently come up with similar thoughts/ideas, impulses, intuitions, etc.)	1	2	3	4	5	6	□
(2) In this relationship I feel my autonomy/individuality is accepted by the other person.	1	2	3	4	5	6	□
(3) Love is an important aspect of this relationship.	1	2	3	4	5	6	□
(4) In this relationship we exchange thoughts freely.	1	2	3	4	5	6	□
(5) In this relationship we both consider important what the other person thinks and feels.	1	2	3	4	5	6	□
(6) I have deep feelings towards this person.	1	2	3	4	5	6	□
(7) In this relationship I want the other person to empathise with me.	1	2	3	4	5	6	□
(8) In this relationship both of us feel safe.	1	2	3	4	5	6	□
(9) In this relationship I wish to see the world through the other person's eyes.	1	2	3	4	5	6	□
(10) In this relationship exchange with him/her is unproductive.	1	2	3	4	5	6	□
(11) In this relationship I am always interested in doing things with this other person.	1	2	3	4	5	6	□
(12) In this relationship verbal communication is not important.	1	2	3	4	5	6	□
(13) In this relationship there is no mutuality in our feelings.	1	2	3	4	5	6	□
(14) In this relationship we have similar interests.	1	2	3	4	5	6	□

Please evaluate how accurately each of the following statements reflects your feelings with respect to the relationship you have with your experimental partner.

Use the following scale for your evaluation:

	never applies	rarely applies	occasionally applies	often applies	usually applies	applies completely	not applicable
	1	2	3	4	5	6	☐
(15) In this relationship we both have little understanding and respect for each other.	1	2	3	4	5	6	☐
(16) In this relationship we both have similar feelings about things, life, etc.	1	2	3	4	5	6	☐
(17) In this relationship loyalty and devotion to each other are not of major importance.	1	2	3	4	5	6	☐
(18) In this relationship I wish to share my thoughts/impressions with the other person.	1	2	3	4	5	6	☐
(19) In this relationship we have respect for each other.	1	2	3	4	5	6	☐
(20) In this relationship we accept each other as we are.	1	2	3	4	5	6	☐
(21) In this relationship the other person robs me of my independence.	1	2	3	4	5	6	☐
(22) In this relationship I often feel alone.	1	2	3	4	5	6	☐
(23) In this relationship openness and honesty are not important.	1	2	3	4	5	6	☐
(24) In this relationship we respect each other's autonomy.	1	2	3	4	5	6	☐
(25) In this relationship the other person is reliable.	1	2	3	4	5	6	☐
(26) The relationship to this other person is meaningless to me.	1	2	3	4	5	6	☐
(27) I believe this relationship will be meaningful to me even after the other person dies.	1	2	3	4	5	6	☐

In responding to this questionnaire you have reflected in depth on your relationship with your experiment partner. This may have led you to re-evaluating how close you feel to him/her. We would appreciate if you would once again evaluate how close you feel in this relationship. In responding it is not important to take your initial response into consideration.

Please use the scale from 0 – 10 (with 10 being most closely bonded)

0 1 2 3 4 5 6 7 8 9 10

That completes the questionnaire. Thank you for your participation.

Appendix G - Relaxation Instructions

Just relax and make yourself comfortable. You may keep your eyes open or closed*, but I want you to keep looking straight ahead. Should your eyes wander that's okay; just bring them back to the centre. I want you to listen very carefully to what I say. Concentrate on my voice, and listen carefully to what I'm saying.

I want you to focus on your breathing now. Take slow, regular, deep breaths. Regular, deep breaths. Breathe with your stomach, so that when you breathe in, your stomach expands. That's right; each time you breathe in you will feel lighter, and become more calm, and each time you breathe out, you will feel yourself getting more and more relaxed. Concentrate on relaxing your muscles as you breathe out. With each breath in you will feel lighter and become calm; with each breath out you will get more and more relaxed. Calm, and relaxed. Calm, and relaxed. Calm, and relaxed.

Keep concentrating on my voice. Listen only to my voice. Ignore any other voices or sounds that you may hear. I want you to focus now on the muscles in your face. Imagine all your facial muscles becoming relaxed. Let them relax, and as you imagine them becoming relaxed, they do relax. Feel the relaxation spread across your forehead, and drain down your face to your jaw. And so now you're able to focus on your jaw muscles; let them relax. Slightly open your mouth, and relax your jaw muscles. That's good. Now feel any tension just drain away.

The sense of relaxation is moving down through your body now. Focus on your neck and shoulders; let any tension flow from your body. Breathe deeply, and as you

breathe out, feel the tension leaving your shoulders. Focus on your arms and hands, and let them relax. Imagine they are becoming relaxed. Breathe deeply, and relax.

Focus on your thigh muscles. Imagine relaxing your thigh muscles. Keep taking slow, regular breaths, and feel your muscles relax as you breathe out. Relax as you breathe out. Relax all your muscles as you breathe out.

Now focus on your calf muscles. Breathe, breathe, and relax your muscles as you breathe out.

And finally your feet. Imagine relaxing the muscles in your feet. Keep taking deep breaths. Regular, deep breaths, and relax your whole body. You are now so relaxed, you can feel yourself sinking into your chair. It's a very pleasant and cosy feeling. Feel yourself sinking deeper and deeper into the chair, and becoming more and more relaxed. More and more relaxed.

* For participants not using the hemispheres, it was suggested that they close their eyes.

Appendix H - Notable Hits and Misses in Ganzfeld Study 1

Notable Hits

Notable hit 2 (trial 21, female-female, friends, mean QECR score 69.31, set 6, target C): "I felt sleepy, like I was sinking into the chair. I saw the pattern of a turtle; every time that went away it would come back, and then I saw a very close-up image of its face. I saw a cake with a candle; that was green. I saw an astronaut, and then I saw a hand that kept going away and coming closer. Then the turtle kept coming back. I saw a man with a cape, and then a schoolboy, not his face but like on a road sign rather than close-up. Sometimes my eyes were closed, and I saw blotches everywhere; these were mainly red but little black ones would also come in."

There are numerous aspects to this participant's experience but several of them resemble the target much more closely than any of the decoys; this is particularly true for the mention of the hand (three of them are visible in the picture), the man, and the blotches of red.

Notable hit 3 (trial 22, female-female, friends, mean QECR 69.31, set 9, target D): "I kept dozing off, and every time I felt myself waking up I saw different things. When I first closed my eyes I could see lots of blue things rising up, and I kept thinking I could hear an aeroplane. Then I could see a country cottage with flowers in the garden. Another time I could see a kitchen with a fridge, a worktop and a table. I could see things moving around, sort of floating in and out; the last time I could see boats in a harbour and hear seagulls. The imagery was colourful but not really bright; it was just normal."

Again there are a number of aspects to this participant's experience, but the description of a country cottage with flowers in the garden is an excellent match to the target, and the picture also contains what appears to be a model aeroplane suspended from a tree.

Notable hit 4 (trial 36, female-female, friends, mean QECR 80.74, set 8, target C): "I was thinking about water because the noise sounds like water. I also saw a general bluey colour."

This is a very brief description, part of which appears to be a response to the pink noise rather than a spontaneous impression, but this aspect along with the blue colour are a clear match to the target.

Notable Misses

Notable miss 2 (trial 24, female-female, friends, mean QECR 72.37, set 10, target D, decoy C chosen): "It was very relaxing. I didn't get too many images, mainly just shapes. I saw a couple of circles. One image that stuck in my head was a window and some sort of head with a neck; it wasn't really a person, more of a figure or statue. The rest of them were just shapes; I kept getting a lot of circles and dots, and I thought I saw a duck. The images were bright but they weren't really colourful; it was mainly one colour, but the circles tended to be black and white. The image of the head was there for about five seconds, but that only came up once; the circles were just flashes but they occurred quite often."

This description contains a number of aspects, but the selected decoy matches strongly on the mention of a person, figure or statue, whilst there are no clear matches with the target.

Notable miss 3 (trial 44, male-female, strangers, set 3, target D, decoy B chosen): "It was very strange. I saw something that had the body of a toy soldier, which was bright blue, but it had a big orange pumpkin head on it, which was very weird. Later I got a flash of a motorbike going round a roundabout, and there was someone in the front; I don't know if it was male or female, but I sensed it was male, and there was a little boy on the back in a bright green tabard. It was going round a roundabout but it was so quick. I also saw a white packet, like a child's toy with different mini Plasticine cars in different colours, including yellow, blue and red; that was quite weird. Then I saw some writing on the wall that had been written with a pen; I can't remember the first part, but it said something plus something and then "= 68". Then I remember seeing a bright yellow door; I couldn't see where it was leading to but it was opening as if I was going to go through it. On top of the door there was an oval egg-shaped glass window, with that old-fashioned metal wire in it. Just after that I got what felt like an electric shock on my arm, which was really weird; that brought me out of feeling really relaxed and then I couldn't get back into the relaxation state after that."

This lengthy description contains a number of aspects, none of which clearly match the target. There are no unequivocal matches to the selected decoy, but the mention of aspects such as people and the colours yellow, blue and red are more closely matched to this than the other three options.

Appendix I - Example Picture Stimuli Involved in Notable Hits and Notable Misses

Picture Set 1

1A

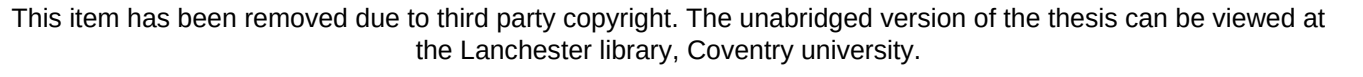
1B

1C

1D

Picture Set 3

3A



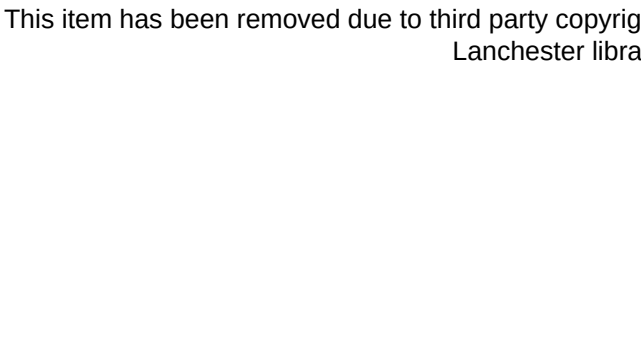
3B

3C

3D

Picture Set 6

6A



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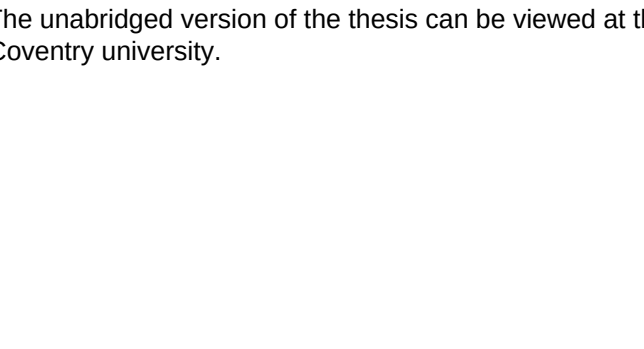
6B



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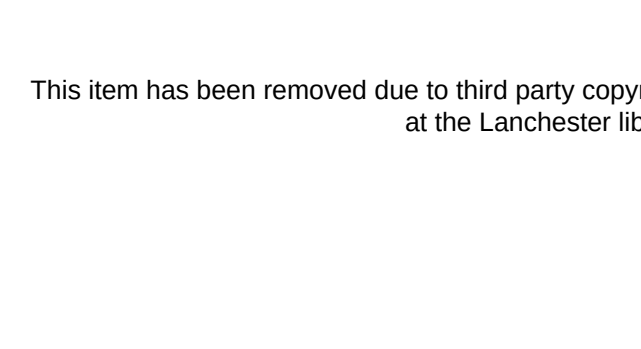
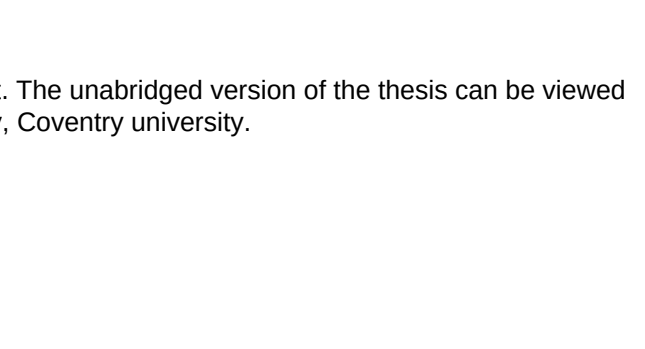
6C

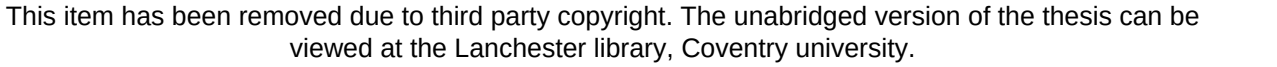


6D



Picture Set 8

8A



8B

8C

8D

Picture Set 9

9A

9B

9C

9D

Picture Set 10

10A

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10B

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10D

Appendix J - Participant Information Sheet for Ganzfeld Study 2

Dean of Faculty

Dr Linda Merriman

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Direct fax 024 7679 5840
Email hsx086@coventry.ac.uk

Coventry University

Priory Street Coventry CV1 5FB

Telephone 024 7688 7688

Participant Information Sheet

You are being invited to take part in a research study. Before you do so, it is important that you understand why the research is being done and what it will involve. Please read the following information carefully, and feel free to ask the researchers any questions that you may have before you begin completing the questionnaire (contact details are given below). Please keep this Information Sheet and one copy of the signed Consent Form.

What is the purpose of the study? Studies investigating extra-sensory perception (ESP) have been carried out in a scientific manner since the 1930s, and the results of many of these studies have suggested the existence of an anomalous process of information transfer. Sceptical researchers have argued that these results are the product of inadequate methodology, statistical errors, or even experimenter fraud, but positive results have still been obtained even as experimental techniques have improved. The present study aims to add to the body of evidence already obtained, in an effort to discover whether extra-sensory perception is a reality. The study will use a traditional technique of one participant (the 'sender') viewing a video recording whilst the other (the 'receiver') attempts to identify the video, but it will also use electroencephalogram (EEG) recording of both participants as a more objective measure, to identify any matching of EEGs between participants. A technique called photic driving (flashing a strobe light towards the sender in an attempt to drive their EEG to a particular frequency) will be used in some trials to examine whether this has any effects on the EEGs of the sender and/or receiver. The study also aims to test whether the biological or emotional relationship between the participants, their belief in paranormal phenomena, and their capacity for mental imagery, are related to their ESP task success, thus exploring some of the processes of ESP.

Why have I been chosen? You have responded to an advertisement to take part in the study.

Do I have to take part? No, taking part is entirely voluntary. If you wish to take part, you will be asked to sign two copies of a consent form, one of which must be returned to the researchers. You are still free to withdraw at any time without giving a reason.

What will happen to me if I take part? You will be asked to complete the following questionnaires and scales before the ESP task: Betts Questionnaire Upon Mental Imagery (QMI), Gordon Test of Imagery Control, Dimensions of Attention Questionnaire, Imagination Imagery Inventory (III), Tellegen Absorption Scale,

Sheep-Goat Scale, Questionnaire for the Evaluation of Connectedness in Relationships (QECR) and the Medical Questionnaire. After the ESP trial, the receiver will be asked to complete the Dimensions of Attention Questionnaire and the III again.

For the ESP task, you will be paired with another participant of your choice, or with another person if necessary. For the first trial, you may decide who acts as the sender (the person viewing the video) and the receiver (the person who attempts to identify the video that the sender is viewing). You will be taken to separate rooms, and asked to complete the QECR which measures aspects of your relationship with the other participant. You will also both have electrodes attached to your head to measure your EEG throughout the trial.

A baseline measurement of EEG activity will be taken for each participant; this will last for five minutes. The receiver will then enter an experimental situation known as the "Ganzfeld" environment. This involves being seated in a reclining chair, closing your eyes while facing a red light, and listening to pink noise through headphones (pink noise is white noise with the harsher high frequencies removed). This setup provides you with constant, monotonous sensory input and leads to a mild altered state of sensory isolation and monotonisation. At the beginning of the trial you will be played a short set of relaxation instructions through the headphones in order to aid your entering into this altered state, and following this the pink noise will play for 30 minutes. During this second part of the trial, please relax and allow any thoughts, feelings and impressions to come to you.

During the second part of the trial, the sender will view a randomly selected 60-second video clip on a computer screen, listening to the soundtrack through headphones. This will be on a continuous loop for 30 minutes, and the sender will concentrate on it in an attempt to telepathically 'send' it to the receiver. In some trials a strobe light will flash towards your eyes for the whole of the 30 minute session, whilst in other trials the strobe will not be used; the usage of the strobe will be decided by a randomisation procedure at the beginning of the trial. The strobe can be turned off at any point if you find its effects uncomfortable.

At the end of the trial, the EEG recordings will be terminated and the receiver will come out of the Ganzfeld environment – your signal for this will be the ending of the pink noise in your ears. The experimenter will ask you to describe all your thoughts, feelings and impressions that you felt during the trial, and these will be recorded using a portable voice recorder. You will then be played four video clips, one of which will be the clip that the sender was viewing. You will be asked to rank the video clips from 1 (most like your impressions during the trial) to 4 (least like your impressions during the trial). Following this, your recorded description will be used by several independent judges to rank the video clips in the same way. You will then be asked to complete the Dimensions of Attention of Questionnaire and the III for a second time.

You will then be given a short break, following which you will swap sender/receiver roles, and the procedure will be repeated.

What are the possible disadvantages and risks of taking part? The main risk is posed by the strobe light, due to the possibility of photosensitive epileptic seizures. We ask that you complete the Medical Questionnaire accurately, since your answers to this will allow us to determine whether or not you can take part. The sender will be accompanied by a researcher at all times in case of any emergencies, and the session can be terminated at any point if you feel uncomfortable for any other reason.

The Ganzfeld environment may also provide a rather unusual experience for the receiver. Again, the receiver will be supervised by a researcher at all times and the session can be terminated at any point if you feel uncomfortable.

What are the possible benefits of taking part? You will gain first-hand experience of taking part in a modern ESP experiment, and may help the researchers in gaining new knowledge regarding ESP, EEG recordings, photic driving, paranormal beliefs, sender-receiver relationships and imagery.

What if there is a problem? If you have a complaint relating directly to the research, please inform the researchers who will try to resolve the matter (details are given below). Failing this, you may wish to contact the Coventry University Ethics Committee chair, Professor Ian Marshall, in writing at AB122, Coventry University, Priory Street, Coventry, CV1 5FB or by telephone on 024 7688 5293.

Will my taking part in this study be kept confidential? Yes. Signed consent forms will be stored in a locked cabinet, and questionnaires will only be identified with a Personal Identification Number (PIN), so your name cannot be linked to your answers. Your name will not be disclosed in the report of the study.

How will my data be used? The 'hit rate' (number of successful identifications of the target) over the whole study will be analysed to see if it differs from mean chance expectation and thereby suggests the existence of ESP. The number of hits will be correlated with the scores from the various self-report questionnaires, to discover more about the process behind ESP; for example, do people who experience more imagination imagery score more highly on the ESP task? The EEG data will be used to examine whether there is any noticeable matching of the brainwaves of two participants during an ESP task, and whether this corresponds to successful identification of the target.

What will happen to my data after the study? Your data will be retained after the study, unless you wish to withdraw it. This is to enable the data to be re-analysed at a later date, either by ourselves or by other researchers. This is common practice in parapsychological research, for example the Journal of Parapsychology recommends retaining experimental data for at least five years.

What will happen to the results of the research study? The study results will form part of two PhD theses by the researchers. They may also be published in psychological journals, depending upon acceptance by the journals' editors.

Who is organising and funding the research? The research is being organised by Ben Roberts, Helen Prudhoe and Dr. Ian Hume of Coventry University. Fundaçao Bial of Portugal is kindly funding part of the research.

Who has reviewed the study? The study has been reviewed and approved by Coventry University Ethics Committee.

Contact for Further Information:

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Faculty of Health & Life Sciences
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Priory Street
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CV1 5FB

Email: aa3222@coventry.ac.uk, prudhoeh@coventry.ac.uk

Thank you for taking the time to read this information. Please now read and sign the consent form if you are happy to take part in the study.

Appendix K - Medical Questionnaire

The experiment in which you are participating involves the use of stroboscopic lights. It is known that flickering lights can induce photosensitive seizures, although the incidence is quite small (it is estimated that about 1 in 10,000 people are prone to photosensitive seizures). The questions below are designed to screen for such people. We would be grateful if you would answer them by ticking the appropriate box.

All responses will be held in the strictest of confidence.

Finally, if you have any concerns at all about the nature of this experiment, please do not hesitate to let us know.

	Yes	No
1. Have you, or any members of your family, ever suffered from any form of seizure disorder or epilepsy?	☐	☐
2. Have you ever received any type of serious head injury or concussion?	☐	☐
3. Are you currently taking psychoactive drugs such as barbiturates, tranquillisers, or stimulants?	☐	☐
4. Are you especially sensitive to bright light or flickering light, or find that such light can cause headaches or other discomforts?	☐	☐
5. Do you suffer from any form of cardiovascular problem or any health problem requiring a physician's care?	☐	☐
6. Are you currently under any medication prescribed to you by your doctor?	☐	☐

I hereby confirm that the above information is, to the best of my knowledge, correct and I have volunteered to participate in this experiment of my own free will.

Signed……..

Print name……

Date……..

Appendix L - Notable Misses in Ganzfeld Study 2

Notable miss 2 (trial 28, female-male, friends, strobe used, mean QECR 58.89, set 13, target B, decoy C chosen): "At the start it felt swirly, but this was probably because I could see the light through my eyelids. Immediately when the white noise started I saw a straight line at the bottom of my vision, so I'm guessing that could be grass or some kind of ground. There was more activity on my right hand side than my left. There was some kind of rounded shape, not a clear smooth shape but more jagged like a bush or similar. If I was pushed to say specifically I would say it was something like a park or lake or something with a watery part, maybe a few ducks on the left, on the right the bush and then a mother and a really small young child, just lying on the grass".

The target was the collapse of the Tacoma Narrows bridge. The unusual swirling sensation perhaps matches the undulation of the bridge before its collapse, and there are numerous trees that potentially match the report of bushes. The straight line is very vague but could perhaps represent the (non-undulating) bridge or the water below. The water aspect also matches the river into which the bridge falls. The chosen decoy was documentary footage of monkeys in snow and water. Although there are clearly a number of differences from the participant's impressions, this whole scene perhaps matches the mentation more closely since the monkeys are in the water and there appear to be families with older and younger monkeys, which perhaps matches the mother and child imagery.

Notable miss 3 (trial 34, female-female, romantic, strobe not used, mean QECR 95.19, set 3, target C, decoy B chosen): "Initially I could see black circles in the middle, colours like green and purple, some patterns as if it was swirling. I couldn't make out exactly what it was, just a dark pattern in the middle with the green and purple around the outside. I could see a tree a lot of the time - this was one of the only vivid images I could get. I could see what I think might have been a peacock at one point. I saw other animals as well, frogs and things like that. The main thing was this tree; it was stronger at the beginning and then reappeared after disappearing for a long time."

The target was a scene from the 1985 film *Ladyhawke* where Michelle Pfeiffer's character falls from a tower and transforms into a hawk. There is one shot of a landscape where there are purple-pink colours but otherwise this is not an especially close match. The chosen decoy was documentary footage of a group of meerkats. The clip includes several small bushes and trees; one shot shows a large tree in the centre of the frame, and one scene involves a meerkat falling from the top of a bush. This inclusion of animals and trees is a good match to the mentation.

Notable miss 4 (trial 35, female-male, friends, strobe not used, mean QECR 69.77, set 24, target D, decoy C chosen): "I felt like I was sleeping, with songs playing in my head. The first image I saw was like a globe spinning around. I saw a plane too, which was nose-diving. Then I was just thinking. I saw myself with [sender]; we were out in the town, going towards the bus stop and stuff".

The target was a scene from a film in which a group of apes emerge from a cave and encircle a large headstone on rocks, with ominous music playing in the background; there are no clear matches with the mentation. The chosen decoy was a scene from the 1977 film *Star Wars Episode IV: A New Hope*, in which planes are attacking the Death Star. Several of the planes are shot down, and the scene ends with the globe-shaped Death Star exploding. These aspects match the participant's impressions very well (excluding those aspects that were clearly thoughts rather than spontaneous impressions).

Notable miss 5 (trial 37, male-male, strangers, strobe not used, set 19, target D, decoy B chosen): "I experienced lots of images and things that were happening to me, but when I came out of the state I didn't remember all of them. They were mainly abstract images involving colours like white and green; this is the first picture I can describe the most, since the others were not that vivid. The colours white, green and black were the most vivid. What also seemed to appear was like a man, maybe Indian or something like that, and also some fish. At first the noise felt like a waterfall, then it didn't feel like anything."

The target was a scene from a documentary involving stop-motion animation of duck-billed dinosaurs building a nest for their eggs, and then a smaller predator dinosaur approaching the nest. There are some green trees in the video, and the eggs are white, but these colours are not especially vivid and otherwise this is not an especially close match to the participant's impressions. The chosen decoy was a cartoon and description of the Babel Fish from the 1981 television series of *The Hitchhiker's Guide to the Galaxy*. The background is black and there are a series of colourful

diagrams, including whites and greens and many other colours. The fish is also inserted into the ear of a man. These aspects match quite well to the mentation.

Notable miss 6 (trial 44, female-male, romantic, strobe not used, mean QECR 90.74, set 4, target C, decoy A chosen): "I was thinking about water, like a blue sea, then images of a beach came into my head. Then I started imagining *Lord of the Rings*, I saw Gandalf, Sauron the big eye. That's all it was, just a big eye in front of me, and I drifted off after that. I could see a white light after that, a big light in front of me that just turned into a big bright white light, then blue, then back to white".

The target was a scene from the 1981 film *Chariots of Fire* where a runner falls during a race, then catches up with the other runners and wins the race. This has very little to match it to the mentation. The chosen decoy was a scene from the 1981 film *Clash of the Titans*. The clip begins with a bird flying over mountains, then moves to what appears to be a Greek-like town in the mountain through the white clouds. The bird lands in front of a light blue background, whilst turning into a man in Greek clothing. As the man lands, the background changes from blue to the white, cloudy background of the mountain. The man then walks into the building where a small group of people are gathered, and speaks with a man sat higher up on a stone throne. A woman from the group then speaks and makes clear that the man on the throne is Zeus, Father of the Gods. Although this is not a direct match to the participant's impressions, the landscape and general tone of the piece somewhat match the fantasy-themed *Lord of the Rings* aspects; the change in colour from white, to blue, to white at the beginning of the clip is also a striking correspondence.

Notable miss 7 (trial 47, female-female, friends, strobe not used, mean QECR 71.73, set 13, target D, decoy B chosen): “I could see mainly black shapes, usually moving away from me, and white dots scattered about. At one point I felt there was a plane or a bird over my top left corner, and later on I felt like something was falling; I imagined it was a parachuting man. A lot of the time the shapes were round, or I imagined the figure of a person moving away. I kept getting a sea of blue that would go from one side of my vision to the other side, or it would come up from the bottom. My eyes couldn’t focus on anything for a while so it was really flickery.”

The target was a scene from *Star Wars Episode IV: A New Hope*, with robots C-3PO and R2-D2 walking through a desert landscape having a conversation and argument. The final shot is of C-3PO walking away from the camera, which matches the mentation imagery of a person moving away, but the other aspects do not clearly resemble the participant’s impressions. The chosen decoy was the collapse of the Tacoma Narrows bridge. The flickering aspect perhaps matches the undulating motion of the bridge; the connecting cables particularly flicker due to the relatively low quality of the recording. A man walks towards the camera from the bridge, not away as in the mentation. The bridge collapses, matching the feeling of something falling, and upon falling the camera moves down to view the water, while the bridge creates a large splash; this perhaps matches the ‘sea of blue’ coming up from the bottom, although the poor colour of the recording means the water is largely grey in colour, while the splash is white. There are therefore some discrepancies and non-matches here, but there are sufficient similarities for this decoy to have been chosen by the participant and all three judges.

Notable miss 8 (trial 67, female-female, friends, strobe not used, mean QECR 64.07, set 6, target B, decoy A chosen): “I saw a lot of aggressive animals, like bears and wolves, and I saw a waterfall. When I saw the waterfall I saw a lot of rainforest animals in the background - tigers and stuff. At one point there was someone unwrapping a present, but I don’t know if that’s to do with it being Christmas”.

The target was a scene from *Clash of the Titans*, showing the wedding of Perseus and Andromeda. Queen Cassiopeia, Andromeda’s mother, states that Andromeda’s beauty exceeds that of the sea goddess Thetis. Upon saying this, the head of a statue of Thetis, in front of which they are standing, falls to the ground, causing everyone present to take cover. The statue’s head then comes to life, rebukes Cassiopeia for her statement, and begins to demand that Andromeda be sacrificed (the clip ends before her demand is complete). This does not match the mentation, other than perhaps the aggressive tone of the scene. The chosen decoy shows a fight between two zebras; this clearly matches the aggressive animals described in the participant’s impressions, although zebras were not specifically mentioned.

Notable miss 9 (trial 72, female-female, friends, strobe not used, mean QECR 67.04, set 10, target A, decoy C chosen): “Besides the noise, there was like a buzzing noise, that sounded like I had a wasp in my ear. I kept seeing a lot of traffic; it was like a train, and then at one point it was like I was in a helicopter. At one point my left side went really tingly, and at one point a giraffe just popped into my head.”

The target was a scene from the 1986 film *The Color of Money*, with Tom Cruise and Paul Newman’s characters potting numerous pool balls. Much of the scene focuses

only on the balls moving on the table and entering the pockets; this does not match the mentation in any apparent way. The chosen decoy was a scene from a film beginning with a view up through tree branches looking at the sky, whilst apparently moving. Voices are then heard, and the rotating blades of a helicopter are briefly heard. The scene then cuts, still looking up at the sky, to viewing a helicopter. The shot then changes to viewing from the helicopter down to the ground, showing several military men, one of whom is lying on a stretcher. The shot again changes to show the helicopter from beneath, winching up the man on the stretcher. It then changes to show the view of the man from the helicopter, before finally showing the point of view of the man as he approaches the helicopter. Although this does not match all of the participants' impressions, the helicopter aspect is a clear correspondence.

Notable miss 10 (trial 73, male-male, friends, strobe used, mean QECR 66.30, set 17, target C, decoy B chosen): "I didn't really get any images, it was more colours; it was like how a lava lamp changes, going between lighter colours like yellows and green. At one point it was like a lime green; that stuck in my head."

The target was a scene from the 1987 film *The Princess Bride*. Two men engage in a sword fight whilst talking and moving around what appears to be the ruins of a castle. This does not match the participant's impressions. The chosen decoy was from a nature documentary showing a series of butterflies on flowers. The colour green is present in many shots, whilst some of the butterflies are yellow in colour, although there are other colours present as well, including reds, oranges, whites and blues. The colourful aspect certainly matches the mentation, and the fluttering of the butterflies perhaps matches the description of the changing of the colours as in a lava lamp.

Appendix M - Example Video Stimuli Involved in a Notable Hit and a Notable Miss

Video 8D - *Cabaret* 'Money, Money' Song

Video 16A - *You Only Live Twice* Autogyro and Helicopter Battle

Video 16C - Marine Iguanas